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Each month millions upon millions of dependable horsepower is produced by Pratt & Whitney Aircraft at its several plants. Operating on a non-profit basis, the new factory at Kansas City, even larger than the home plant, is now producing "more powerful" Double Wasp engines to add its share to this already staggering total.

PRATT & WHITNEY AIRCRAFT

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Sure—Herr Schicklegruber—woman's place is in the home. And NOW you know how far American women will go to protect the homes you threatened!

When the Battle of Production called for reinforcements — our American women acted — and magnificently! Today you are feeling the fruit of their toil as bombs from warwings they fashion rip the heart from your Reich.

At Doak Aircraft over 50% of workers are women whose stout hearts and adroit hands deliver vital aircraft parts and sub-assemblies ahead of schedule. These women of Doak and hundreds of thousands like them work without stint so that never again will a paperhanger attempt to hang crepe on the door of free democracy.

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TORRANCE, CALIFORNIA

WRIGHT POWERS THE TONNAGE OF THE AIR

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Why put an air-cooled aircraft engine in a tank? Because no other engine packs as much power into such small size. Tanks and gun carriers slog into battle on caterpillar treads, but they are similar to aircraft in that they require an engine high in power, small in size, and light in weight. Other engines of equal power are massive, creating a vicious circle in which large size demands more armor plate, in turn adding weight and calling for more power to maintain speed.

Seasoned by years of operation in transport, private, and trainer planes, the Wright Whirlwind was the logical choice for the Army's medium tanks and gun carriers. This engine, weighing but a scant 1% of the M-4 tank's 30 tons, packs 400 HP plus in its 45" diameter.

Enlisted in our armored divisions, the Whirlwind was assigned to combat duty with virtually all medium tanks and heavy gun carriers to reach the fighting fronts. In no sense a competitor to the air tonnage hauling Cyclone, the Whirlwind has nonetheless lived up to the Wright engine family tradition for light, compact power, adaptable to many purposes.

★ ★ ★

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Cyclones and Whirlwinds · Light · Compact · Powerful **WRIGHT** *Aircraft Engines*

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THROTTLE RESPONSE
WITH GUIBERSON LIGHT WEIGHT DIESEL
POWER

FOR TANKS • FOR PLANES • FOR SHIPS

Power when it is needed at a touch of the hand—that's the Guiberson radial air-cooled diesel! The instant response to the throttle of Guiberson engines is the result of the amazingly effective simplified injection system that delivers fire-safe liquid fuel directly into the cylinders under 2,500 lbs. pressure. In planes, in tanks, and in light ships the fast response of the Guiberson can spell the difference between destruction or victory. For low-cost, dependable engine operation without fire hazard or radio interference, it's the Guiberson—America's only radial air-cooled diesel engine!

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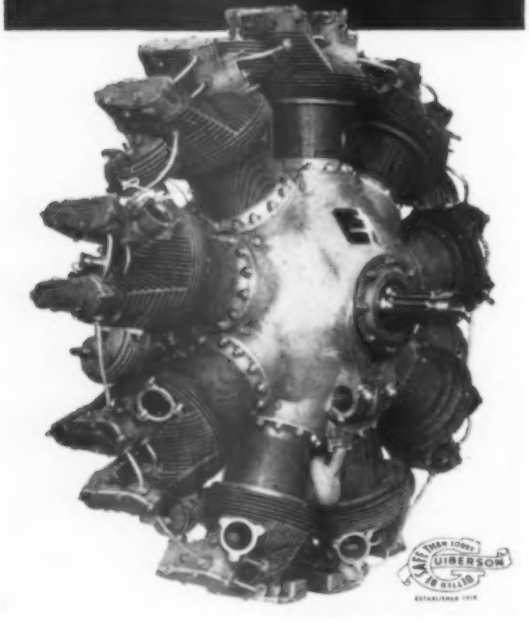
GUIBERSON DIESEL ENGINE COMPANY
Dallas, Texas
THE GUIBERSON CORPORATION
Aircraft and Heater Division



Southern Flight

Eleventh Year of Publication
and Faithful Service to the American Aviation Industry

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Announcing

GREATER LOCKHEED

Two great names in aviation—Lockheed and Vega—were compacted on December 1, 1943, into a new and greater organization, the Lockheed Aircraft Corporation.

This greater Lockheed now employs nearly 100,000 people—in more than one hundred geographical locations, in eighteen nations on five continents.

Thus the new organization accomplishes even closer cooperation between Lockheed and its former wholly-owned subsidiary, Vega.

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Your cooperation in properly addressing such communications will be your assurance of their prompt delivery.

GREATER LOCKHEED BUILDS

THE LOCKHEED P-38 LIGHTNING FIGHTER

THE LOCKHEED VENTURA BOMBER

THE LOCKHEED CONSTELLATION TRANSPORT

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LOOK TO *Lockheed* FOR LEADERSHIP

LOCKHEED AIRCRAFT CORPORATION, BURBANK, CALIFORNIA

The Birdmen's Perch

WE'RE FLYING the Gulfhawk out of Ft. Worth these days. Being this close to the world's largest butadiene plant gave us a yen to see it. So we gassed up with G.A.G., strapped Flutter on the wing, and headed for Port Neches.

Perch Pilots—*it would take forty five million rubber trees to produce the*

rubber that will be made in one year from that butadiene!

We told you last month that the Neches Butane Products Company (that's the name of this nonprofit organization) covers 314 acres. Now we want to amend that statement.

It not only covers it . . . it *blankets*

it and soars over it! Why, there are towers there that are 15 stories high. Fourteen of them! And there is other equipment that is so complex and so big that it looks downright immoral.

When Gulf and four other petroleum companies all pitched in with the Government to design, build, and operate this gigantic butadiene plant, they proved again that the oil industry has only one thought—a victorious peace.

Major Al Williams,

alias "Tattered Wing Tips "Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh 30, Pa.

BRAINTWISTER

Erwin Schwatt is one of our favorite Perch Pilots—and we're sending him a Perch Diploma to prove it.

For years now, we've worked on the Perch knowing that if we ran short of Braintwisters or Whoppers, all we had to do was to reach into the mailbox . . . and find exactly what we needed from Erwin Schwatt.

Well, we ran short of Braintwisters this month, reached into the mailbox, and sure enough . . .

"A pilot crosses the equator, flying southeast, (135°). In 72 hours (nonstop

on G.A.G.) he is just 5 miles from the South Pole. What will his approximate position be 3 hours later (still flying)?"

Schwatt—may his engine never cut—sent the answer, and we'll shoot it along to you if you write.

TAKE IT OFF!

Many warplanes in this country are being stripped of their warpaint.

Removing the greenish-gray camouflage paint from a bomber makes more difference in the plane's performance than

you might think. For with the paint removed, the 17's and 24's can actually go farther and carry a greater load!

In lubricating oils, there are certain parts which are just as superfluous to the job of lubrication as camouflage was to planes in domestic service. In Gulfpride, however, these unnecessary components have been removed to the *nth* degree by an extra refining step, the Alchlor Process. And with more of these troublemakers removed, Gulfpride can actually go further in your engine and carry a greater lubrication load than inferior lubricants.

Gulf Oil Corporation and Gulf Refining Company...makers of

GULF **GULF AVIATION PRODUCTS**

OIL IS AMMUNITION—USE IT WISELY

SHUT DOWN THE ENGINE AND MAKE AN INVESTIGATION IF THE OIL PRESSURE GAGE···
···FAILS TO INDICATE PRESSURE WITHIN 30 SECONDS AFTER ENGINE HAS BEEN STARTED.
SHUT DOWN THE AIRPORT AND MAKE AN INVESTIGATION IF YOU FIND ANYTHING IN YOUR
CLOSED
···FUEL TANKS BUT THAT GOOD GULF AVIATION GASOLINE

Bill's *Idea* Is In The Fight Too!

Bill has only been in the army a short time, but he's been in the war a lot longer!

As a youngster he re-built jallopies in a wrecking yard and at home he built model airplane motors, a hobby that made sense in his life. That was before Bill came to Solar where he was recognized as one of those born mechanics . . . and given a job equal to his skill.

Now, while he's pitching shells at the enemy and overhead is the air-cover of American planes he helped assure, he feels mighty good about the "Tube-flarer" he developed at Solar. And he should feel good because that part of him, that machine tool, saves hours of tedious hand labor flaring airplane manifold tube ends. Bill's idea speeded the production of American airplanes and it's still delivering the goods that will bring him back sooner to his model motors and the job he deserves.

The reason Bill likes Solar and is looking forward to his peacetime job is because — as he says, "the outfit really *makes* things!" He feels that the future is bright where a fellow has an opportunity to do more than just assemble parts . . . where thought and skill put an indelible stamp of quality on a product.

ARMY E NAVY

SOLAR

STAINLESS STEEL PRODUCTS

SOLAR AIRCRAFT COMPANY • SAN DIEGO 12, CALIFORNIA

JUST AMONG OURSELVES *Editorials and Comment*

Beginning of The End

THE sudden and unanticipated cancellation last month of CAA-War Training Service instructor course contracts, including all secondary, cross-country and Link instrument courses, came as a severe surprise and heavy blow to WTS contractors, students and employes.

The Army did not see fit to give any advance notice whatsoever. There was no opportunity provided to graduate students in training who were about to receive their instructors' certificates. Some fifty-nine contractors, fifty-four colleges, 963 instructors, 1,000 mechanics, over 350 ground school instructors and more than 4,000 students were affected.

This order throws fear into every operator engaged in flight training programs including the sixty-odd civilian contract schools now providing all AAF primary flight training. Particularly insecure now is what's left of the CAA-WTS program, which automatically expires next June unless new funds are voted. This appropriation doesn't seem at all probable.

Even though the Army and Navy programs are not cancelled out, it's best to expect the worse. If not completely washed out, one can expect reduction after reduction until contract flight training tapers off into final liquidation.

There is one bright spot in the picture, but it alone will not give cohesive strength to our wealthy nonscheduled civil aviation resources. This is the expected "boom" in miscellaneous flying activity that will naturally come with the release of CAA-WTS airplanes and equipment for sale into private hands. Private flying will take on a semblance of its old prewar self. Individuals and companies can purchase back the flying equipment appropriated from them by the Government for the various training programs. The recent relaxation of certain restrictive measures on private aviation also augurs well for personal flying activities.

This field of development is not at all comparable to a greater field of endeavor wherein vital service can be rendered to the war effort. We refer specifically to the opportunity now facing the administration to provide relief to our overtaxed transportation systems including air, highway and rail. As the tempo of our strategy is stepped up, putting more and more fighting men into action across the seas and keeping them supplied, our already jeopardized transportation facilities will be called upon to do the impossible.

Fortunately the Army is releasing some airliners to the scheduled operators, but not in sufficient quantity as yet to take care of requirements. Even though the trunk line aviation companies should receive enough equipment, relief to ground transportation facilities would not be substantial. What we need, and need quickly, is a highly integrated system of short-haul "feeder" air services all over the nation. Only through *new* services that such a network would afford can there be any real contribution to the transportation problem solution.

The present administration can establish such a system through its Civil Aeronautics Board. Most of the equipment and personnel of the flight training contractors could be immediately utilized, especially if the military services plan to take over all training and close out the civilian contractor, which appears so probable at this writing.

As reported in SOUTHERN FLIGHT last month, CAB issued its first "feeder" contract in history. It was awarded to Essair, Inc., which will establish a line in Texas running from Amarillo to Houston, Texas, via Lubbock, Abilene, San Angelo and Austin. It's our serious contention that if a company without planes, personnel, maintenance shops and operating bases can establish a short-haul feeder airline, certainly the highly experienced, adequately staffed and magnificently equipped flight training contractors could transform their operations to mail, freight and passenger hauling practically overnight with the very minimum of time and trouble.

Don't get us wrong — we're not against the award to Essair. Fact is we applaud loudly the action of CAB in breaking loose one log from the jam that's built up over the years among hopeful as well as established applicants. The heart of the matter is in the fact that the proposed program of expansion by utilization of available resources would be a wartime measure designed entirely to take on a portion of the domestic transportation burden, which is increasing in weight rather than becoming lighter. Simultaneously, the airlines would be allowed to expand. But the major job would be the inclusion of hundreds of communities in our domestic air service pattern.

We admit it's a long shot. There is so little vision regarding aviation in official Washington. We hear a lot of talk up there about postwar "paper" plans but very little about taking care of present needs that cry out at every turn for attention and intelligent handling.

It will be the beginning of the end for one of the wealthiest resources in the nation today if our fixed-base operators are not given additional war jobs when their flight training duties are liquidated.

★ ★ ★

Clarification

LAST month's lead editorial covered recent CAA action in relaxing certain restrictions imposed on private flying immediately after Pearl Harbor. One requirement was the maintenance of twenty-four-hour armed guard protection. The official release states that the airport manager will be responsible for seeing that aircraft are not operated under any conditions by unauthorized persons. About the only way this could be accomplished would be through the use of guards specifically hired to carry out this responsibility. In conversations with CAA inspectors, we find that they believe it's the airplane owner's responsibility to guarantee no unauthorized person will have access to the owner's airplane. If there is no guard, the airplane will have to be rendered inoperative.

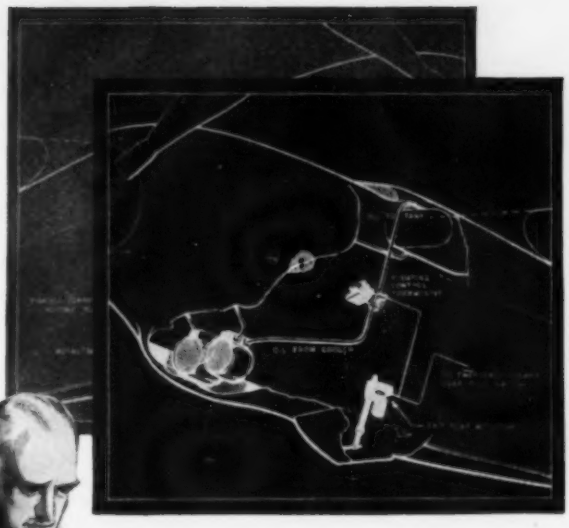
We asked one inspector what would happen if a saboteur should steal an airplane and go out for some dirty work. He replied that the airport would probably lose its designation. But he didn't know what would happen to the airport operator or to the airplane owner.

Both large and small airports are still maintaining twenty-four-hour guards, or people who are supposed to act as guards. Due to the manpower situation and existing high wages, the maintenance of twenty - four - hour armed guards works an extreme hardship, especially on the small airport operator.

There is considerable confusion surrounding the guard requirement and the CAA should broadcast a clarification forthwith.

FIRST SUCCESSFUL AUTOMATIC EXIT FLAP CONTROL SYSTEM. AiResearch developed it in 1941. Lightweight, simple in design and made of standard aircraft parts, this electrically-operated system provided a 32° F modulation range between flap open and flap closed.

Advantages: Less instrument watching for pilots. Greater protection for engines. A cut in open-flap time that reduced cooling drag and increased airplane speed.



FURTHER ADVANCEMENT MADE BY "FLOATING CONTROL" (left). An achievement of AiResearch engineering, it enables the thermostat to control the actuator directly—at a rate in proportion to deviation in control point temperature. Through constant temperature control, it reduces open-flap time still more. And provides these—

Additional advantages: An action free temperature band adjustable to meet any requirement—eliminating unnecessary actuator operation near control point. Weight-savings up to 20%. Simplified wiring. And no vibration-sensitive contacts . . . no relays or follow-ups.

Now A NEW AiResearch-designed ACTUATOR

Being "first" to develop new systems is not enough. Constant changes in aircraft design bring greater demands—call for constant improvement of even the finest equipment.

The new actuator for AiResearch Automatic Exit Flap Control Systems meets such a challenge. Developed for a newer and bigger American bomber, it provides advantages for all aircraft.

SIMPLIFIED MAINTENANCE. The motor of this improved actuator can be serviced and brushes changed merely by *removing one spring clip!*

HIGHER EFFICIENCY. Actuator is completely spur-geared. Though smaller and 13% lighter, it supplies *three times more horsepower output* . . . moves exit flaps much faster under greater loads. Available for either A. C. or D. C.

DURABILITY. AiResearch's design has proven rugged under the toughest *load tests* . . . under rigid *temperature tests* ranging from -65° F to 175° F. And *life tests* have not been able to wear it out!

ARMY-NAVY

Complete information on this latest AiResearch development and its adaptability to all types of aircraft is now available to American aircraft manufacturers and designers.

AiResearch
MANUFACTURING COMPANY
LOS ANGELES • PHOENIX
DIVISION OF THE GARRETT CORPORATION

"Where Controlled Air Does The Job" • Automatic Exit Flap Control Systems • Engine Coolant Systems
Engine Oil Cooling Systems • Engine Air Intercooling Systems • Supercharger Aftercooling Systems

NOW IT CAN BE TOLD: From January 1, 1939, to November 30, 1943, the Army Air Forces Training Command graduated 100,799 pilots, 20,086 bombardiers, 18,805 navigators, 107,218 aerial flexible gunners and 555,891 ground and air combat crew technicians. Nearly all the pilots qualified for combat, except 3,491 glider pilots, 2,348 liaison pilots and 444 women pilots. Among the half-million technicians were 240,360 airplane mechanics, 100,339 radio operator mechanics, 70,166 armorers, 98,974 specialists in the "miscellaneous" category, and 46,052 clerks. Interesting sidelight: To become a combat crewman on the super B-29, a technician must complete five different courses—basic mechanic, advance electrical specialist course, advanced mechanics and electricity at the B-29 factory, and a final course for armorers.

An idea of the tremendous training expansion is shown in the fact that the Army in all of 1939 graduated only 696 pilots from its two schools. In the first eleven months of 1943 it graduated 61,730 pilots from 135 schools. The Training Command was a major air force in its own right at the end of 1943, operating 29,000 training planes. During last year's first eleven months Training Command students flew 25,600 hours per fatal accident (for AAF's official safety record see page 27).

★ ★ ★

TIME FOR ACTION, NOT SPEECHES: **When the Army and Navy revealed the terrible atrocities inflicted on Bataan's defenders, the truth made America's blood boil. But what got us was the way the politicians on the Potomac started yelping in public. They wanted to rush out and hang the emperor and a lot of other things.**

As known by everyone familiar with our shameful unpreparedness before this war, our undermanned, ill-equipped Pacific outposts suffered because some of these same politicos refused adequately to fortify the Philippines and other areas. Pearl Harbor, of course, was due to treachery. But we weren't as ignorant about Jap preparedness as some would have us think. Was it, for example, a surprise to find the mandated islands, such as the Marshalls, heavily fortified against us? For the answer, and some down-to-earth background which should inspire all of us, we respectfully refer you to page 24, where Colonel Robert L. Scott, Jr., relates how the arrogant Japs gained the upper hand—all the while laughing in our kindly faces.

COLONEL ROBERT SCOTT (third from left) and hunting companions with geese killed on December 23, 1942, on Lake Yeching in Yunnan Province for General Chennault's Christmas dinner. At this feast was told the authoritative account of Japanese defiance while illegally building "tennis courts" in the mandated islands of the Pacific. (See page 24.)

★ ★ ★

AIRPLANES FOR SALE: The Defense Plant Corporation is getting ready to release for sale hundreds of airplanes formerly used in the CAA-War Training Service program. As soon as an airplane is released it will be posted on a list which will be open for public inspection in the CAA Regional Offices. A date will be set for receipt of bids at the Regional Office. Bidders will be required to accompany their bids with a certified check in the amount of 10 per cent of their bid price. All sales will be subject to approval of the DPC and subject to the new price ceilings established by the OPA for used airplanes of not more than 500 hp. If you want a list of airplanes available, write the War Training Service in care of your regional CAA office.

The recipe, therefore, is as follows: The HPO (hopeful private owner) gets in touch with the WTS of the CAA for a list of DPC airplanes. DPC gets your bid and 10 per cent check. If you comply with OPA you might get the GDT. Although not required, it might be well to include three passport photos, a statement from your mother that you were actually born, and three letters of recommendation.

★ ★ ★

IN THE AIR: **Biggest fighter on our side is now Northrop's twin-engined P-61 "Black Widow"—a night fighter of twin-boom construction, but with a multi-place cabin of larger dimensions than that of the P-38. . . . The Germans haven't broadcast it yet, but some observers believe they have some jet-propelled super interceptors to throw against us when the air war becomes critical. . . . From forced landings and crashes the Luftwaffe has resurrected a number of B-17's and operates them extensively in an effort to anticipate U. S. developments in tactics. . . . Ever see anybody spin a P-38? We haven't either. But Capt. R. E. Stemen of Wright Field, recently returned from forty-five missions around Tunis and Bizerte where he fought the Germans in a Lightning, says he saw a buddy spin away from a couple of ME-109's. "First he let her tumble from 25,000 feet to 15,000, but when he leveled out the ME's were still with him, so he spun again, coming out in a cloud at 5,000," said the veteran, who assured us he saw it with his own eyes.**

★ ★ ★

CAR REVISIONS: The Civil Aeronautics Board has launched a general program aimed to simplify Civil Air Regulations.

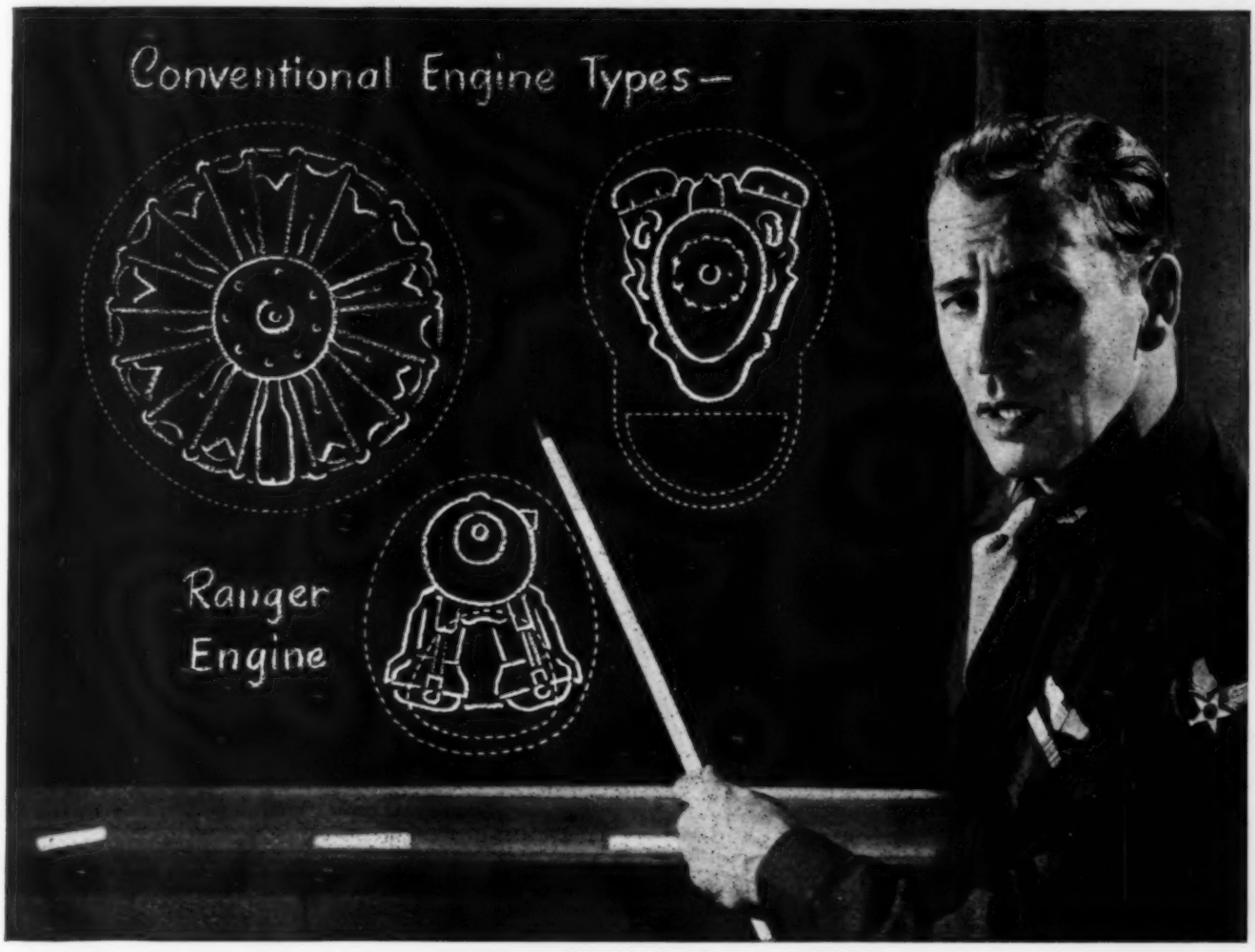
To start the ball rolling, the Safety Bureau recently submitted a draft of proposed revision of Air Traffic Rules, Part 60 of CAR, for the preliminary comment by interested persons prior to the consideration by the Board of the proposed revised regulations.

A copy of the revised Air Traffic Rules is available upon request to the Civil Aeronautics Board, Department of Commerce, Washington, D. C. It is suggested that all interested parties write for a copy and make their suggestions, because final action on the regulations will be taken only after all suggestions and criticisms have been carefully considered. The date set for the return of comments to the CAB is March 15, 1944.

It will be interesting to learn just what the reaction will be and how many people send in their suggestions. Practically every private flyer is for simplification, but we predict few will take the time to send in their views.

Here's your opportunity, folks! You asked for it, so get on the line.

POINTERS ON ENGINES . . . . . *No. 1 of a Series*



Why Ranger Turns The Power Plant *Upside Down*

The Ranger Aircraft Engine is unique.

It is the *only inverted*, in-line, air-cooled engine in production today.

Fairchild engineers worked ten years developing and perfecting this outstanding inverted power plant. They sought a practical engine design that would:

1. Make flying safer by giving the pilot greater vision than is possible with conventional engines.
2. Increase efficiency of performance by reducing and streamlining the air-resisting frontal area.
3. Simplify the usually complex task of maintenance and daily inspection (a vital safety factor) through easier access to the power plant of the airplane.

That the Ranger Engine fills the bill on these 3 vital counts . . . and on others, too . . . is attested by the fact that the U. S. Army Air Forces have chosen Ranger-powered planes, the famous Fairchild PT-19's and AT-21's, for the task of training quickly thousands of pilots and aerial gunners.

When Fairchild engineers turned aircraft engines upside down and produced the Ranger, they did it with an eye to safer, speedier, more efficient sky travel—another example of Fairchild's "touch of tomorrow in the planes of today."

BUY U.S. WAR BONDS AND STAMPS

RANGER AIRCRAFT ENGINES

Division of Fairchild Engine and Airplane Corporation · Farmingdale, Long Island

DON'T LOOK NOW— BUT HERE COMES 444 LADIES STOCKINGS

YES Sir!—Bombyx Mori, that Jap silkworm, has another knot in his tail. Parachutes are being made of Cellulose acetate rayon. Strong parachutes. Safe parachutes!

It is acetone—produced by Shell from a waste petroleum gas—which changes a cotton derivative, cellulose acetate, to a syrupy liquid: the "spinning solution." This is forced through holes of microscopic fineness. Presto! Silky fibers. These are twisted into thread. From then on, you can name what you want—from sheer, glamorous stockings to a parachute!

Thus—one more outstanding contribution to America's war effort from Shell.

* * *

Shell was first, too, to supply American military aviation with a super fuel —100 octane gasoline—giving our planes new speed, flying range and tactical advantage. Later Shell discoveries vastly increased both the power and production of aviation gasoline.

Such achievements are reasons why the majority of the country's leading plane and engine makers use Shell Aviation Fuels. And why Shell Aviation Products are also preferred by many airlines, aviation training schools, and airports.

Farsighted airport operators will find Shell's wartime popularity a profitable peacetime asset.

First oil refinery to win Army-Navy "E" Shell's Wood River Refinery.

FINER FUELS FOR THE AGE OF FLIGHT

The Guy on the Ground Crew

Sure, the guy who stays on the ground wins battles in the sky.

He works at an improvised airfield many miles from nowhere. He services battle-scarred planes to fly and fight again. He, *literally*, keeps 'em flying!

The skill of our aviation mechanic is one military asset the Axis can't copy. It's partly the product of a superb training program. Partly, a mechanical knack for making things work.

We like to think that there's something of this typically American genius in the way men and women of Bell Aircraft build the U. S. Army Airacobra. They started with the idea of a "cannon on wings." To make this idea work, they designed a swift, single engine, cannon bearing fighter. They're building 'em—fast!

They ask no higher praise than to be considered team-mates of the guy on the ground crew

File this thought away for postwar reference. The men and women of Bell Aircraft will be ready for their assignments . . . ready with a war born habit of *thinking* new planes, techniques for designing, engineering and building them, a knack for making them work. © Bell Aircraft Corporation, Buffalo and Niagara Falls, New York.

MEMBER AIRCRAFT WAR PRODUCTION COUNCIL—EAST COAST, INC.

BELL *AIRCRAFT*

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PACEMAKER OF AVIATION PROGRESS

BUY WAR BONDS AND SPEED VICTORY

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☆ MOST, by far! If all Curtiss Fighters built since hell broke loose throughout this world could take off at top speed from one huge base, they would form a deadly circle of flying might 25,000 miles in circumference—a tornado of power and a living symbol of American aerial supremacy that would encircle the globe.

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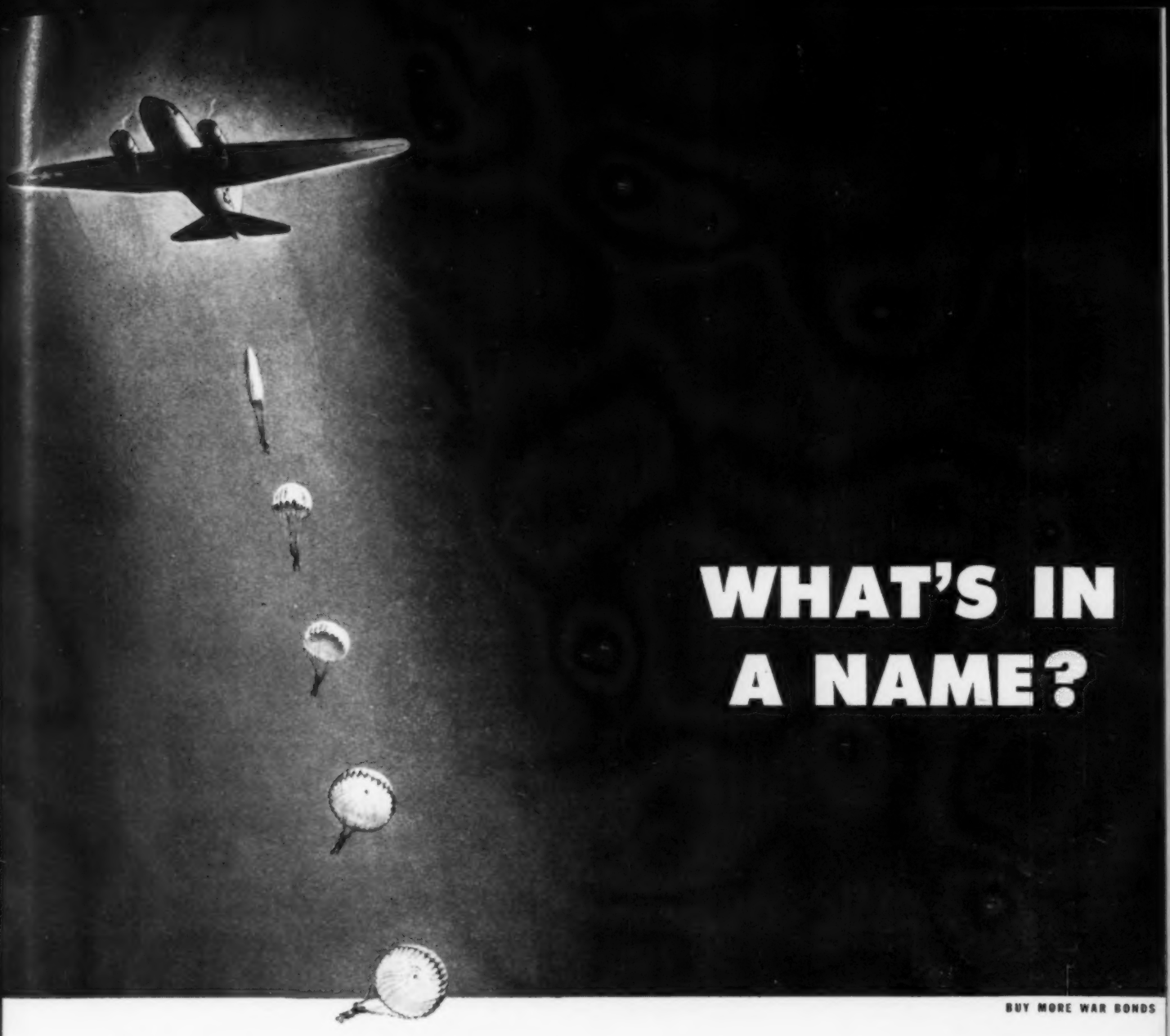

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DOUGLAS is FIRST in aircraft war production, FIRST in variety of models produced. Dive bombers, attack bombers, long range heavy bombers, cargo carriers, troop and paratroop transports—all of dependable Douglas manufacture—are carrying the fight to our enemies and supplying our forces on every front. It is the pride of over 150,000 men and women who build these planes so well that now, more than ever, no other name in aviation means so much to so many as "Douglas."

C-47 "Skytrain" C-54 "Skymaster" C-53 "Skytrooper" Combat Transport | DB-7 "Boston" A-20 "Havoc" | A-24 and SDB "Dauntless" Dive Bomber | B-17F "Flying Fortress" Heavy Bomber | B-24 "Liberator" Heavy Bomber

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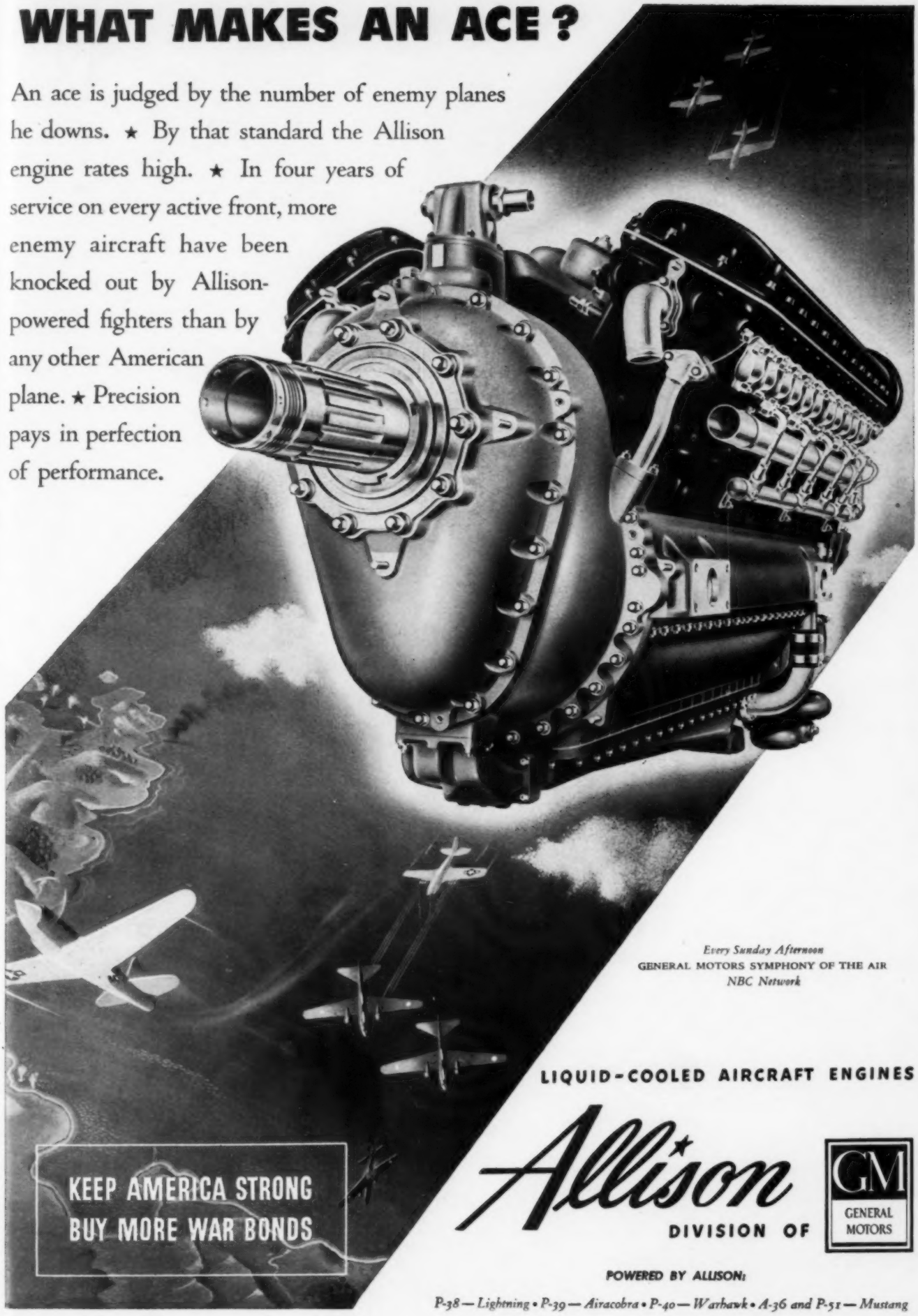

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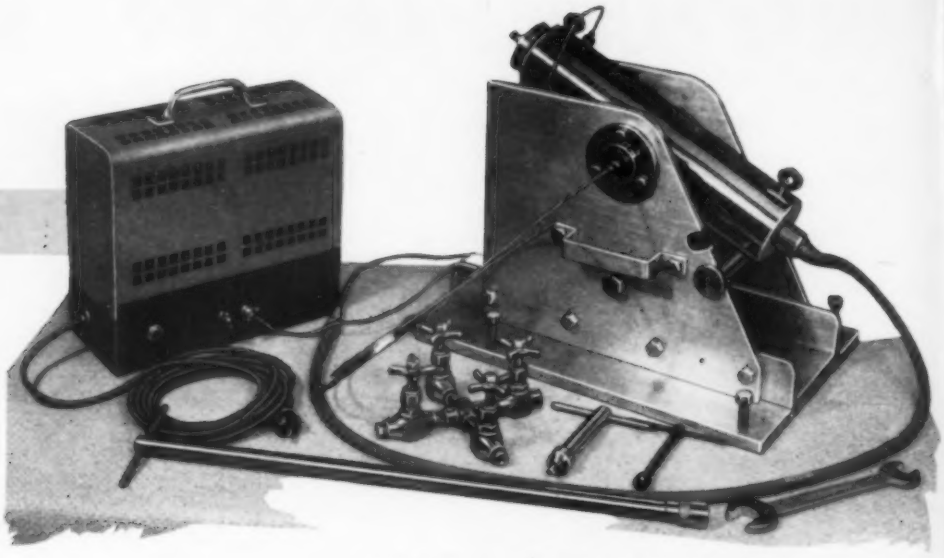

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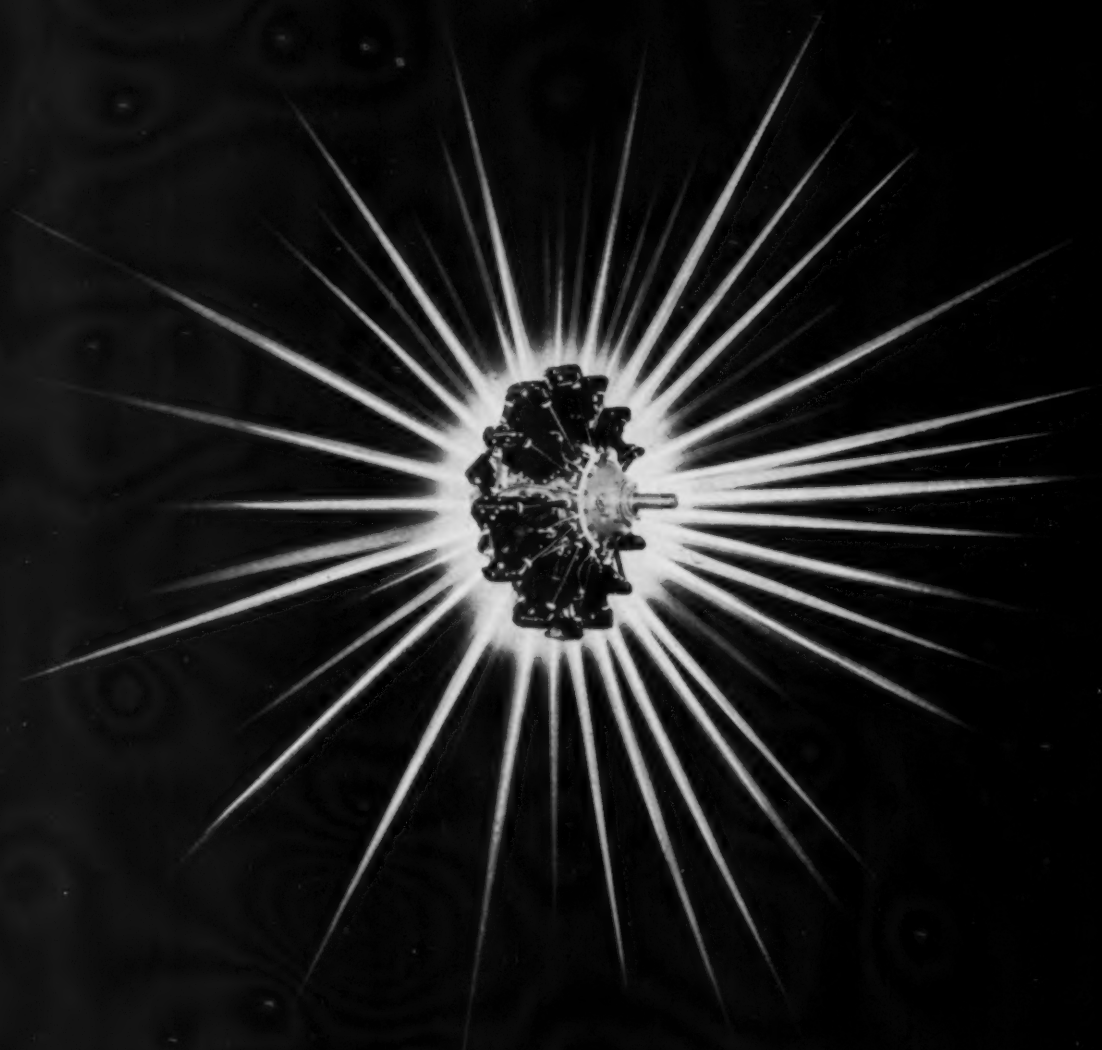

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The ultimate TENSION *of Battle!*

THIS is the ultimate tension of battle... the unfailing spring of the magneto contact breaker. On its tension depends the vital delivery of 40,000 timed sparks a minute to each of a big bomber's engines. That is why, before they are judged worthy to work in a Bendix-Scintilla* Aircraft Magneto, these springs must first pass long, grueling tests at speeds up to 5,000 r.p.m.—must run the gauntlet of more than 13,000,000 breaks before acceptance.

Here is one more striking example of the minutely painstaking tests that back up the precise engineering and careful workmanship in every Bendix-Scintilla part... one more reason why our airmen go into battle confident that they have the best equipment in the world. Soon, we hope, the care and engineering ingenuity that Scintilla Magneto Division has contributed to the high development of Aircraft Ignition will be applied to our great Transports of Tomorrow.

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Bendix-Scintilla Aircraft Magnetos, Harnesses and Switches, vital members of "The Invisible Crew," are standard equipment for the major aircraft engine manufacturers, including:

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THE INVISIBLE CREW
Precision Equipment by Bendix Aviation Corporation

*TRADE MARK OF BENDIX AVIATION CORPORATION

AN *Absorbing* ARTICLE

A NEW DEHYDRATION PACKAGING AGENT DEFEATS METAL'S DEADLY ENEMY — CORROSION

by Elizabeth McKechnie

A bag of Protek-Sorb is tied to each cylinder of the engine. Inset: Protek-Plugs, the plastic cartridges containing silica gel which are inserted in place of the spark plugs

PASS THE BICARBONATE

(Continued from page 4)

Newsworthy-Trustworthy

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The name "IRVIN" on the harness means the chute is produced in an Irving Factory with over 23 years' experience and skill in chute-making.

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Founded in 1920. There is only one qualification for a life membership: in an emergency men and women who have saved their lives with Irvin Air Chutes.

Many of the personnel of the flying services engaged in all phases of war have successfully used their Irvin Air Chutes in extreme emergency.

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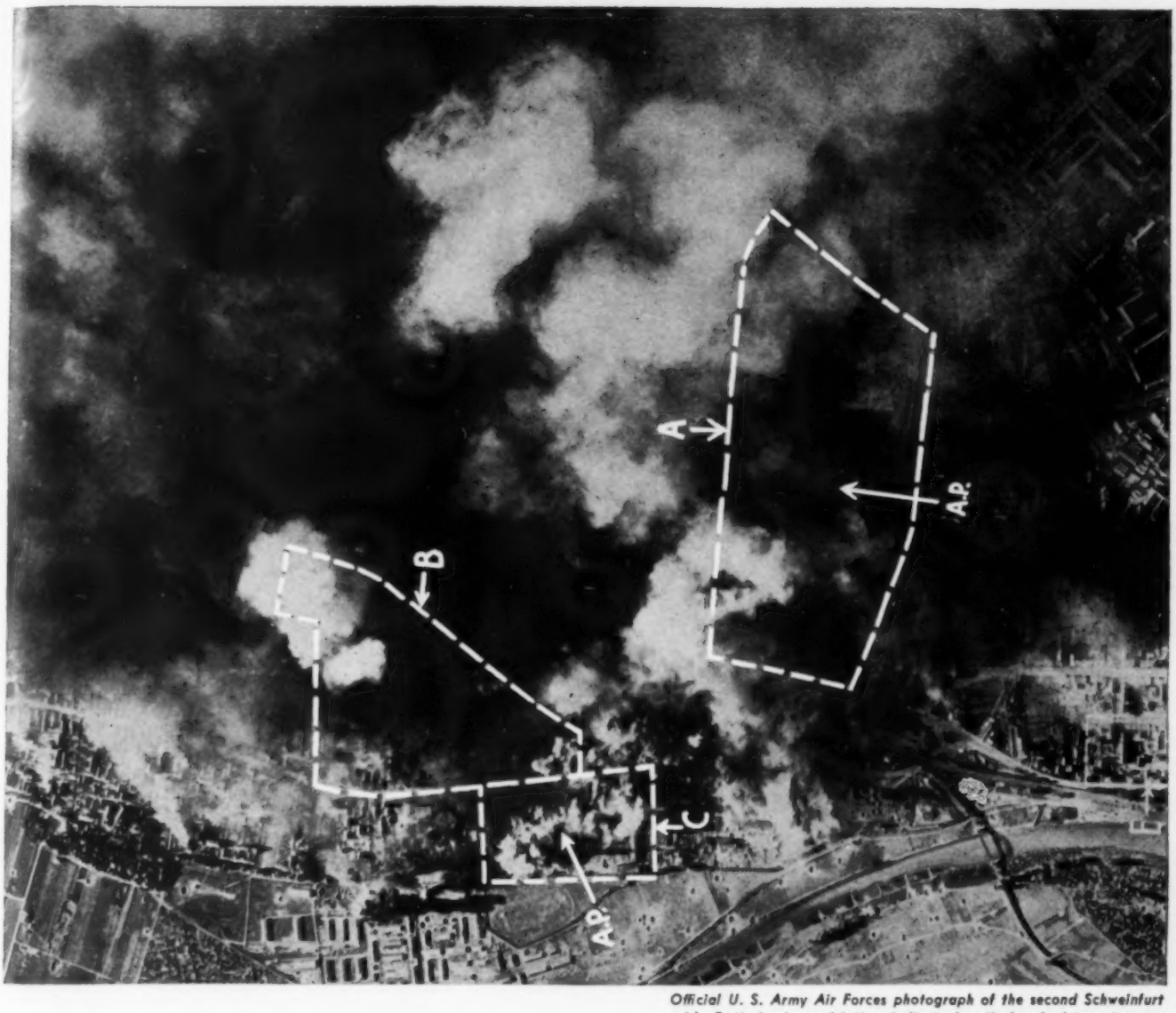


Official U. S. Army Air Forces photograph of the second Schweinfurt raid. Dotted rules and letters indicate heavily bombed target areas.

Schweinfurt Story

Both sides knew it was a major engagement — that second bombing mission against Schweinfurt. It was a battle between large armies, for a crucial objective. The Nazis massed 60% of their total fighter strength in a vain effort to prevent the Boeing Flying Fortresses from getting through.

In a period of a few hours the Forts invaded German-held Europe to a depth of 500 miles, sacked and crippled one of her most vital industries. They did it in daylight and they did it with precision.

They moved in on a city of 50,000 people and destroyed the part of it that contributed to the enemy's ability to wage war. When that part of it was a heap of twisted girders and pulverized machinery, they handed it back, completely useless, to the Germans.

• • •

This is the task for which the Boeing Flying Fortress was designed: *precision destruction by daylight, in areas where the going is toughest.*

It is not an easy task. The Germans tried it in the Battle of Britain, and gave it up as too costly when 185 of their own planes were shot down in a single day.

The Fortress is engineered to perform superbly at altitudes of more than 7½ miles; it bristles with effective firepower; and it can absorb such punishment, and still keep flying, that the Germans have even devised special rocket-gun fighters in the vain attempt to drive it from their skies.

Fortresses are lost, of course . . . sometimes many of them on a single mission. But a recent check shows that over a 12-month period, an average of more than 95% of them have returned from each attack. Their stout-hearted and superbly trained crews have never yet been turned back from their objectives by enemy opposition!

• • •

To produce a plane like the Fortress requires unusual qualities of research, design, engineering and manufacture. You can expect these same qualities in the peacetime tomorrow, knowing that any product "Built by Boeing" is bound to be good.

SHORTEST WAY HOME

With ample equipment and supplies, our Air Force in China will deliver decisive blows against Japanese shipping and homeland installations. How the situation looks to Chennault's men is graphically told here by their former Fighter Commander, whose tactical and writing achievements have won unique honors.

By COL. ROBERT L. SCOTT, JR.

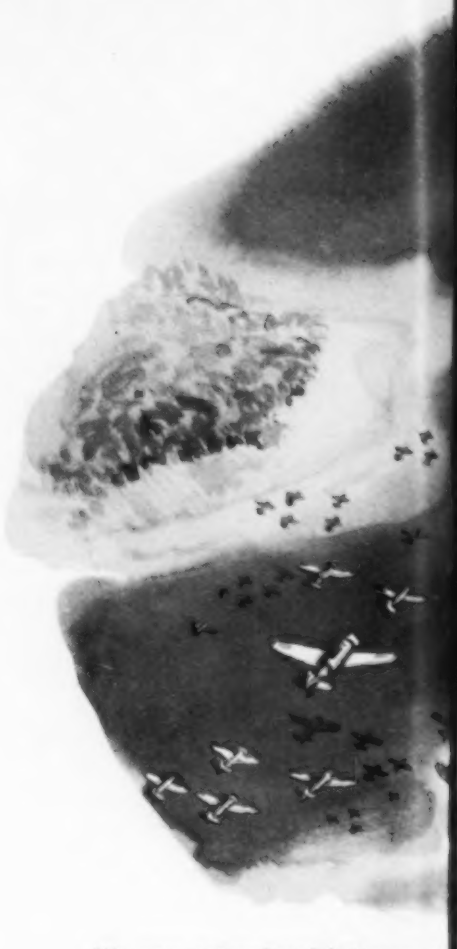
ON CHRISTMAS EVE of 1942 we sat down at our base in China to a good Burma goose dinner and I heard a story that demonstrated how arrogant the Japanese had been in planning their attack on civilization. To me it also demonstrated how unprepared we had been in mind and spirit as well as materially.

Our American Consul, who had been in Hongkong when it fell to the Japs, told us there at the table how repeatedly he had reported great numbers of Japanese freighters leaving Kowloon and passing out through Victoria Harbor by Hongkong Island. Their destination proved to be the Marianas, the Carolines, the Marshalls, and the Gilbert Archipelagos. Finally, to America's repeated query as to what the cargo was on these increasing numbers of ships, the Japs replied, "cement".

Then after the Japanese had protested about the United States building an airdrome in Alaska, we asked them belatedly: "What are you doing with so much cement in the Pacific atolls?"

The Japs showed their teeth, their arrogance—and their confidence in our unpreparedness—and replied: "We are using cement to build tennis courts." Those tennis courts were, of course, the bases of Truk and Yap and a hundred other jumping-off places for the day that make "Asia for the Asiatics".

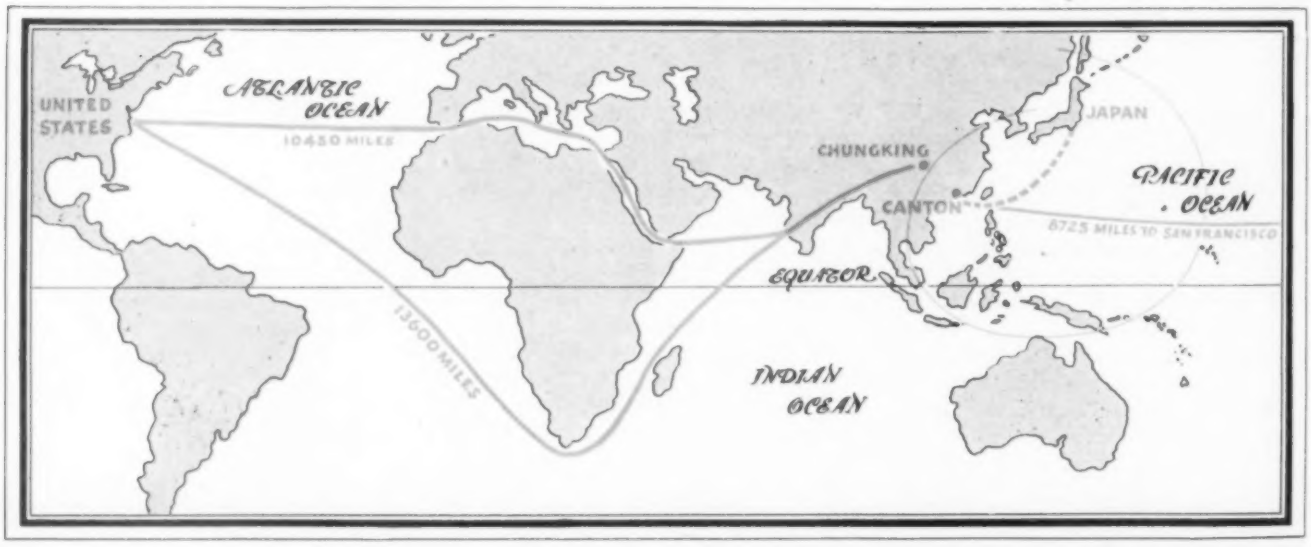
We are now building our "tennis courts", but so far our bases are farther away than they must be in the end.



We were outnumbered but never out fought. Once six P-40's shot down thirteen Japs in four passes through their fifty-three Zeros. We lost only one P-40, but figured we lost the unequal battle. The Japs could re[place] [read]

I remember . . . on that Christmas Eve back in 1942 . . . we in China

The air war against Japan is a battle of supply lines. Note the route our planes and supplies must negotiate to reach China, which is presently supplied by air. The small dotted line shows the extremely short supply route from Japan to Canton, jumping off place for Jap air supplies in China.



BEST COPY AV

lace thirteen Zeros over a short supply line of only several hundred miles more readily than we could replace that one P-40 over our 13,000-mile supply line.

had a lot more to thank the Lord for than the geese and ducks He let me bag on Lake Yeching, the cranberry sauce the war correspondents sent me from Calcutta, and the egg-nog that C.N.A.C. Pilot "Cousin" MacDonald brought us from India. We had General Chennault—our boss.

One P-40 Worth More Than Thirteen Zeros

Out there at the end of the supply line we were exponents of the theory that "The longest way round is the shortest way to Tokyo". We were proving it by using the tactics and the strategy of the General and his knowledge of what made the enemy tick. We were outnumbered but never outfought. We sometimes met Jap attacks of fifty-three Zeros with as few as six P-40's, but we never met them in such a position that permitted them to employ the guns of their fifty-three fighters against our six. We just followed the Boss's instructions to the letter and struck from out of the sun and from above the enemy and always at *their weakest point*. Whether we hit them or not we would never circle around to see—in fact, we wouldn't waste time looking anywhere—but would dive out and on away from their superior numbers until we could safely climb back to fighting altitude again without having a Zero on our unmaneuverable tails. Then we'd climb straight into the sun (so the Jap couldn't see us) and strike again in the same or like manner.

On one such day, over a field in the Hunan Province, we shot down thirteen Japs in four passes through their fifty-three Zeroes and lost one of our six shark-nosed fighters. The remainder of the enemy planes turned and fled in the direction of their bases, but

Supply shortages aren't the only problem in China, as shown below. At left are coolies with ox carts building an airdrome with hands and crude tools. The pilots (center) often amuse themselves with card tricks while awaiting orders and supplies. The mud (right) looks bad at this Yunnan base. The Curtiss P-40's are 23rd Fighter Group planes, in take-off position with alerted pilots standing near but out of the picture.

—(Left and center photos by Col. Scott. Yunnan base photo by Hank Johnson, Lockheed Service Representative in China.)

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(Army Air Forces Photo.)

Col. Merrian Cooper, Maj. Gen. Claire Chennault, Capt. Carleton and Major Ajax Baumler looking over a captured Zero (top photo). Colonel Scott, author of this article and the best-seller, "God is My Co-Pilot," is shown at right standing by his Curtiss P-40. He is now stationed in Florida.

even then we figured *we had lost the unequal battle*. It was like this: The enemy had lost thirteen fighters he could replace over a supply line that was several hundred miles long, but we could not replace the one P-40 that we had lost, for our supply lines were over thirteen thousand miles long —and lay across enemy territory. Even that *one ship* was vital to our small number of fighting planes. We were confident in our pilot souls, though, that the enemy High Command heard reports from their returning pilots that made them certain they had been set upon by far more than six American P-40's. In fact, Tokyo radio that same night reported "many of the barbaric American airmen had been destroyed when the superior force of P-40's met the invincible Sons of Nippon." At the time we certainly did not call them sons of *Nippon*.

When I first arrived in far Eastern China, I remember we used to sit around, looking askance at our dilapidated flying equipment. We felt sorry for ourselves. No one ever sent us fighter planes to China. No one bothered to send over the bombers with which we could have driven the Jap Air Force out of the skies. We had little food and no mail from home. You see it's hard to be on a low priority front and understand that your country is fighting a war on nine to twelve major fronts. It's always hard to imagine any place but "your front". I know now that our faces were very long—we did lots of collective grousing. Then, finally, I looked one day at the map and saw how far it was from our supply bases in the USA. We were at the end of the longest supply line in the world. Why, we were lucky to get anything! More than that, though—we were *lucky to be out there*—there was very little red tape that far from home—and we could fight. We didn't have to sit around day after day and wait for the enemy to come like our poor brother pilots had had to do in the Philippines, in Java, in Singapore, and in Rangoon. We had that "God-given and Chennault-perfected" air warning net that four hundred and fifty million Chinese worked on. We knew when the enemy rolled their planes out of their hangars to start some of their raids. We even knew when the hangar doors opened. I know now that we began to gain heart and morale from that moment on.

Fighting Against Odds — and Winning

Oh, for a time we kept looking into the west for fast-moving P-51's—and for the breath-taking "Lightnings"—for theoretical B-29's and B-32's—for all the mythical fighters that we had seen in books that filtered through the "Delhi Imperial Blockade." But of course these never came; they couldn't have been sent—then.

Suddenly we quit "looking" and fought with what we had. Things worked out so well that we were no longer sorry for ourselves. By following the General's tactics and using the *good* qualities of the versatile P-40 against the *bad* factors of the enemy Zero, we became so confident we began to feel sorry for the people back home. We developed an escort system —with our fighters co-operating with our bombers—that instilled confidence into the crews of the B-25's and increased their effectiveness many fold. We flew close to our small bomber formations so they could see us all the time. Perhaps those crewmen felt the same as we did about seeing their friendly silhouettes—and their good black American guns sticking out in all directions. Perhaps the friendly white star of the American insignia made them feel we were going to guarantee they would reach their targets unmolested, and, after delivering the bombs, were going to see that they got home without too much trouble. I know those white stars were to me like the Stars and Stripes waving in my face—to me they were real parts of home and America. Anyway, the bombers' accuracy increased, and that is saying something; those few bombers in China could hit a dime from eighteen thousand feet. Also, in all our hundreds and more raids over China, Indo China, and Burma we only lost one B-25 in combat.

After four months of practice with this "squirrel cage about the bombers" we were able to take them into Canton from our eastern bases and see their bombs sink three Japanese freighters and set fire to the docks at Whangpoo. Then we intercepted forty-five Zeros that were climbing to attack and with our twenty-odd fighters shot down twenty-nine of the enemy without allowing them to get a shot into the perfect bomber formation. I know as I left that battle I felt like the star on a victorious football team. We were no longer amateurs, but had turned professional.

How to Defeat Japan

But with all our offensives and victories in China, our small force has only held and not beaten the Jap. From these fields we flank every Japanese task force and convoy that goes to the Southwest Pacific and to Singapore. We flank the vital route of supply to Saigon from which point the supplies go by road to Bangkok—to Chengmai—to Rangoon. *Put enough fighter planes, fighter-bombers, and bombers into China to work from our*

(Continued on page 48)

ARMY ACCIDENTS *in Peace and War*

The record shows a sharp upturn in Army Air Forces combat training fatalities, with a slight increase in flight training mishaps. But the accident curve is now reported falling.

THE fatal accident rate in Army Air Forces training, the subject of much rumor and misinformation since the 1940-41 expansion program, has leveled off after a sharp increase after Pearl Harbor, according to the Office of War Information, which in January issued the official facts and figures comparing prewar and wartime rates.

Considering the size of the training program, the shortness of time in which it must be completed, and the faster and heavier planes used in combat training, the figures indicate the AAF is doing a good job in holding down accidents and fatalities, OWI commented. In revealing the figures, OWI used for "prewar" the period from 1930 to December 7, 1941, and for "wartime" the period from Pearl Harbor until October 1, 1943. Here they are:

In combat training (skip-bombing, deliberate bad weather flying, tight formations, night-fighting tactics, night navigation and low-level strafing), the wartime fatal accident rate has been .182, or 182 fatal accidents per million flying hours, as against a prewar of .082, or eighty-two fatal accidents per million flying hours.

In flying training (elementary, basic, advanced and transitional), the prewar rate was .034, or thirty-four fatal accidents per million flying hours. The wartime rate is about the same, being .035, or thirty-five fatal accidents per million hours.

The prewar fatality rate for all Army flying training, including both flying and combat training, was .062, or sixty-two fatal accidents per million flying hours, while the wartime rate for all flying training has been .080.

Higher than the rate of fatal airplane accidents is the fatalities rate for the total number of persons killed in air accidents. In the wartime period 194 persons have been killed per million flying hours as against a prewar rate of 103 persons killed per million flying hours. A breakdown shows that in prewar flight training forty-six persons were killed per million hours, while during wartime the number is forty-nine.

In wartime combat training, the number of persons killed per million hours is 521 as against a prewar total of 145 per million flying hours. The accident curve, after rising slightly during the first two years of the air expansion program, is now falling.

Pilot Error Chief Cause

The most frequent cause of fatal airplane accidents in wartime was cited as being personnel error, which accounted for 48 per cent of the total. Materiel failure (structural or engine) accounts for 12.4 per cent. Undetermined causes were blamed for 37.4 per cent and miscellaneous causes for 2.2 per cent.

Fatal wartime airplane accidents in the Army most frequently involve collision in full flight with an object other than an airplane, such as a mountainside, tree or telephone poles. Such accidents have been 27.1 per cent of the total number. Other types of accidents are listed as follows: Spins and stalls without engine failure 14.6 per cent, collisions with other aircraft 8.2 per cent, forced landing 5.8 per cent, landing 5.3 per cent, structural failure 4.6 per cent, fire 2.8 per cent, spins and stalls following engine failure 2.5 per cent, taxiing 0.7 per cent, undetermined 12.1 per cent and miscellaneous 7.8 per cent.

Wartime training has shown the fighter to be the most dangerous plane to fly, as it has a fatal accident rate of .431, meaning 431 fighters figure in fatal accidents per million flying hours of combat training. The safest is the primary trainer, only twenty-three of that type plane figuring in fatal accidents per million flying hours of flight training. The light bomber, with a rate of .321, is second most dangerous type. Other types and their fatal accident rates are basic trainer .052, advanced trainer .050, medium bomber .227 and heavy bomber .125.

The Army Air Forces has established an elaborate and thorough flying safety program. The Office of Flying Safety is attached directly to the staff of the AAF commanding general, and in its organization are 550 officers, 300 enlisted men and 350 civilians. Six major subdivisions constantly strive to improve safety through accident prevention, investigation, medical work, flight control, safety education, research and statistics. Enforcement of AAF rules and regulations concerning training is being pressed constantly, and a field enforcement branch is now being activated. A central recording of air safety violations is maintained for uniformity of disciplinary action. Violations are classified in three categories, the most serious being prohibited aerobatics, low flying and flying too close to other aircraft. These Class I violations are punishable by heavy fines, confinement to the base and sometimes dishonorable discharge.

23-Year Record of Accidents

As of November 10, 1943, the Army Air Forces official record of "all accidents and fatal accidents" per 1,000 flying hours is as follows:

Fiscal Year	All Accidents Rate	Fatal Accidents Rate
1921	4.667	.582
1922	5.060	.368
1923	4.304	.502
1924	2.811	.235
1925	2.069	.200
1927	1.611	.199
1928	1.361	.137
1929	1.481	.163
1930	1.439	.114
1931	1.149	.053
1932	1.139	.086
1933	1.021	.065
1934	1.101	.094
1935	1.008	.073
1936	.829	.081
1937	.688	.052
1938	.626	.063
1939	.533	.044
1940	.510	.049
Continental USAAF		
1941	.581	.052
1942	.739	.077
1943	.709	.082
1944*	.630	.070

*First fiscal quarter (July, August, September).

Two versatile Jeeps—the winged version in the background—meet in this scene at a Northwest Army Air Base for delivery of air cargo by the little Luscombe. The pilot, Major Moodie of the South Dakota Wing of the Civil Air Patrol, stands by his Courier Service parcels.

CARGO FLYING

643,907 Miles by Jeep

"EASY, Silver" "Steady, Boy," admonishes the "Lone Ranger," as he drops his hand soothingly to the neck of his great white stallion, or caressingly pats him on the shoulder, all the while maneuvering him over a particularly rough spot or guiding him into one of the Ranger's strategic positions. The expression evidences an alliance built up between a man and a horse, which is akin to complete undertanding. Just as surely there is an alliance built up between a man and his airplane, which borders on complete understanding. They come to know each other, a knowledge that can only be the outcome of close association. This understanding develops the feel, builds that commanding confidence, which directs the airplane in its flight, spelling safety of operation with capital letters, and is the earmark of a good pilot.

That the Courier Pilots of the Civil Air Patrol — the "Pistol Packin' Papas" of the "Cargo Jeeps" know these things is well evidenced in their records of achievement. Their story is not conversation passed from person to person over a convivial glass of (hic) soda pop, for on reams and reams of paper in Courier Commander "Pop" Hinkley's desk is inscribed the factual data. In the files of each Wing Commander this information is available for his operations on Courier. What we expect to set forth hereinafter as a picture of the Courier operations in South Dakota might just as well be written about any of the Wings in the Western part of the United States, but because we are writing the story, our information is naturally confined to our own files.

The October, 1943, issue of SOUTHERN FLIGHT carried an article under the caption of "Air Cargo by Jeep."

This covered a period of operation of light planes in South Dakota for the first six months of this past year. Our interest has centered on establishing the ratio of these first six months with the entire year, and to further develop whether the operations figures would stand or fall over a twelve-month period, remembering that during the first six months of most every year flying conditions are not as good or conducive to completed schedules as the second six months. It must be borne in mind that the planes started in Courier service were either new or reasonably new. What their condition would be after twelve months of operation was problematical. Now we can truthfully say that the planes for all practical purposes of operation are in just as good condition as when they were started on the service. They have been repaired and overhauled when needed, and in fact, at our operations headquarters we maintain a complete repair base, with three employes. The expense of maintaining this base and the cost of repairs is all included in the totals, as shown on an accompanying chart of operation. This chart should be carefully studied in connection with this article, as it graphically shows and establishes the facts for our conclusions.

By
LT. COL. T. B. ROBERTS, JR.
Commanding Officer South Dakota, Wing, CAP

Planes

It will be noticed that we always had six planes available for service; that at the present time we have eleven planes, not all of which are used every day, as some of them are in the shop or on stand-by. We always had four daily flights, and for a time in the middle of the summer we had seven daily flights. We then lost three

flights, and since the 8th of November have had two additional flights added. What flights we fly or how many planes we use to make these flights is not material in our story, as we must predicate our conclusions upon the actual mileage flown, the poundage hauled, the hours required, and the cost of operation.

It was called to our attention after the last article on Courier, that in establishing costs nothing was included for dispatchers, ground personnel used in ticket selling, advertising, etc. The point of our statements was missed as we never attempted to give the complete cost of operating an airline. We gave factual figures from which actual cost can be derived by addition or subtraction. There will be subtraction because Courier Pilots are paid flat rates, while an airline as an organization could buy gas, oil, and necessary parts at cost. Courier Pilots pay profits to supply houses or oil companies for the commodities they purchase. The fact that the planes are still flying on the allotments of the government is adequate evidence that these are sufficient, otherwise the planes would soon be grounded.

Pilots

At no time in our operations did they require more than eight pilots on duty. These eight have been our nucleus. All have signed for the duration. When we lost flights we spread out the work so that there was an equal amount of service for all. Special flights or missions are continually developing, and now more than take care of all available regular pilots. The Operations Officer also flies regular and relief shifts. Since November 8th we have put on two additional full-time pilots to fly two additional regular flights. More pilots are available for work as it develops and they will unquestionably be necessary with our rapid increase in poundage.

The Chart

The accompanying chart has been compiled on a monthly basis, and gives complete information from November 16, 1942, to and including December 15, 1943, a period covering one year and thirty days. The same rate of pay has been maintained for the pilots—$8.00 per day; the same rate on the hourly operation of the planes has held—$5.92 per hour including insurance. The rate of pay on the planes is paid only for the actual hours flown, which is block to block. If the pilot was weathered out, his pay continued, but the pay on the planes stopped. So the picture is actual in every respect.

COURIER PERFORMANCE OF 65-HP AIRCRAFT

Period	Total Mileage	Hours Flown	Flights Completed	Cancelled Flights	Aircraft In Use	Pounds Cargo Carried	Pouches Mail	Total Salary	Cost of Operation @ $5.92 per hr.
Nov.*	12,170	178:15	34½	7	6	331½	24	$ 854	$1,055.24
Dec.	32,630	436:55	97	45	7	6,613	104	1,708	2,586.55
Jan.	32,630	454	96½	87½	9	8,041	176	1,708	2,687.66
Feb.	35,950	475	101½	66½	8	7,921½	180	1,708	2,772.50
Mar.	42,175	583:50	125½	60½	8	10,344½	213	1,708	2,865.28
Apr.	40,490	561:35	121	59	8	7,466½	221	1,708	3,324.68
May	67,295	653:30	140½	25½	8	12,180	223	1,708	3,868.72
June	55,934	812:35	166	16	9	19,860	278	1,708	4,751.58
July	73,430	1088:15	216	2	10	22,464¼	362	1,708	6,442.44
Aug.	72,250	1087:15	212½	4½	9	12,463	386	1,708	6,437.52
Sept.	47,345	747:30	158½	11	8	29,004½	358	1,708	4,425.20
Oct.	45,265	717:45	151	24	9	34,947	318	1,708	4,249.08
Nov.	50,908	753:20	157¼	38½	10	38,422	341	1,708	4,459.73
Dec.†	35,435	512:05	104½	17	11	24,951	215	1,708	3,031.53
Totals	643,907	9059:50	1882½	464	120	235,030	3,399	$23,058	$52,957.71

*Nov. 16-30 only.
†Dec. 1-15 only.

Weather

Just one short paragraph on the subject of weather. It will be noticed from the chart that during the first six months of this year operations were checked out on about a third of the time available, while during the last half of the year the bad days dropped to less than one-tenth of the time. This bears out our statement as to flying conditions, at least in South Dakota. A composite picture of the western half of the United States could very easily be drawn, and from our reports emanating out of the Courier Commander's office it is surprising how uniform they run, at least with 10 per cent variation. Of course comparatively new pilots may have had something to do with this picture. Now we find our boys flying most any time a ghost will walk. We try to hold them down to CAA regulations, and thirty-mile winds, but sometimes winds increase in velocity during flight. There have been instances when we have set light planes down in winds up to fifty-five miles an hour.

Mileage

The World Almanac is our authority for the statement that the circumference of the world at the equator is 24,906 miles—25,000 miles for all practical figuring purposes. We have flown during the period of the chart 643,907 miles. This is about twenty-six times around the world. Roughly figuring, we fly once around the globe every two weeks. Not a small operation by any means but a fair comparison to establish the operation of one Civil Air Patrol Wing on Courier.

Hours

We have flown to cover this mileage 9,059½ hours. This figure, divided into the number of miles flown, gives us an average speed of seventy-one miles per hour. It is the same for the first six months. In other words, it may reasonably be assumed that flying four different makes of ships in almost continuous service, the light planes can be expected to average this speed indefinitely.

Cargo

We hauled 238,429 pounds of cargo in 1,882½ flights, which gives us an average cargo load of 125 pounds. This materially increased over the first six months of the period, when we averaged seventy-eight pounds per trip. It will be intersting to note from the chart that the first two weeks of our operations we hauled 355½ pounds of cargo, and the last two weeks as shown we hauled 25,166 pounds. During the last five and one-half months of operation, our average load jumped up to about 170 pounds, and we hauled almost 70 per cent of our poundage during this period.

This is a fair indication of what the Army thinks of the Courier Service, and the "Pistol Packin' Papas" have reason to feel proud of the fact that their contribution to the war effort has added many thousands of hours to the training of pilots for combat duty. There is another way of valuing this service to the government, when we consider that this cargo is mostly strategic motor parts, urgently needed supplies from medical to mess, mail, etc., which, when taken to the place it is needed in the shortest period of time, materially steps up the tempo of all training activities. Time always is a factor, and never so much so as during war. We may conclude that the "Cargo Jeep" has saved thousands of dollars and thousands of hours over slower surface transportation.

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Flying Firepower

A force of 700 heavy bombers carries a total of 9,100 hard-hitting .50-calibre machine guns. To match this firepower gun for gun would require an interception force of 2,275 enemy fighters, each mounting four guns. In other words, each heavy bomber has thirteen guns to four for each interceptor, or an advantage of more than three to one. In the Boeing cutaway drawing at right the artist illustrates Flying Fortress firepower. Since the drawing was made, the Fotress has added a two-gunned chin turret under the nose.

—Boeing Drawing.

AIR POWER IN ACTION

By TOM ASHLEY

★

WHEN World War II was ushered in by the German invasion of Poland in 1939, the prophets, led by no less an "expert" than Hitler himself, predicted a short conflict. The deciding factors, they reasoned, would be battlefield aviation and mechanized ground forces. For a while things hurried along at break-neck pace, and the world learned the meaning of "blitzkreig." But a few things developed to interrupt the timing of the prophets and Hitler. He ran out of air power, for one thing. Or, more correctly, he discovered in the Battle of Britain that fighters and dive bombers were inherently unsuited decisively to carry the war beyond the battlefield and into the strategic resources of distant strongholds. Last month the chronologists noted on the calendar that World War II — the "blitz" war — had outlasted World War I.

Before the first month of the new year was through, many new developments marked the growing strength of the anti-Axis air forces. Unpreparedness at Pearl Harbor had delayed the immediate display of strategic air power by the United States Army Air Forces, and it took our production and training programs until late 1943 to demonstrate, with vigorous force instead of phrases, the full meaning of our air strategy. But the month of January, 1944, will go down in the books as one of the most impressive periods in the air phase of World War II. It was in January that:

Attrition against both German and Japanese air forces reached unprecedented proportions. Their combined losses exceeded 1,500 planes in three weeks. Allied losses were less than 600 planes.

Allied battlefield aviation reached its highest zenith in intensive forays against enemy troop positions in Italy, the Southwest Pacific and Southeast Asia, the latter being Burma.

Arnold Sums Up

But before going into January's particulars, it is important to consider a significant and revealing report made during the month by General Henry H. Arnold, Commanding General of the U. S. Army Air Forces. He submitted it not to the Chief of the Army Staff, but directly to the Secretary of War. General Arnold, in addition to tracing the development of U. S. air power from Pearl Harbor until a few weeks ago, had this to say about the status of our aviation in the European conflict:

"It is difficult to appraise the present struggle for air supremacy as representing anything short of a major turning point in the war. What American and Royal Air Force bombers can do to the whole German war machine, once the German fighter force is rendered impotent, needs no comment. The issue hangs now on which side first falters, weakens, and loses its smashing power. . . . We will not falter."

Clearly, then, General Arnold expects a crisis soon, or, as he expressed himself on January 4, "in the near future." If the present rate of attrition of German fighter aircraft on the Western front continues, and German aircraft factories producing those fighters continue to suffer progressive destruction, a point will be reached where German reserves are exhausted.

In those words can be found the formula which Allied air power will follow over Europe in the immediate future. German aircraft factories are the No. 1 target for our bombers. The No. 2 objective — attrition against German fighter strength in the skies — will be accomplished simultaneously, as heavy bomber raids have become the only effective device to lure Luftwaffe fighters into battle —they now disregard fighter sweeps and even allow some bomber formations unmolested access to European targets outside the German homeland. Accomplishment of these two objectives is the key to invasion.

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Highlights of Allied air action during January pointed to an immediate crisis in Europe while stepped-up offensives in Southeast Asia and the Southwest Pacific imperiled outermost Japanese bases.

A Preface to POSTWAR PLANNING

Part I—Federal Aviation Legislation

By GEORGE HADDAWAY

★

WHEREVER airmen gather these days there's always talk of postwar planning. What kind of airplanes will we fly after the war? Will they be cheaper and easier to keep up? Will there be enough landing facilities and other aids to airmen? Will there be a place for me in aviation after hostilities are over? What can we do now to guarantee we'll never again be caught asleep at the switch? What kind of scheduled air transportation system will we have? Will our great aircraft factories be turned into skating rinks when the blow-up comes? And will we maintain a world-wide Air Force? These few samples reveal a cross section of current thought and expression regarding aviation in the postwar era.

There are always a few who say, "to heck with all this planning—let's get on with the war." To them we would answer: "Yes, it is a bit anachronistic to talk of the postwar world after reading of the Japanese atrocities perpetrated on American and British prisoners of war. But we failed so miserably in our prewar aviation planning, we ourselves, a fifth-rate air power, paved the way for the Japs into Bataan and Corregidor. The anachronism of talking now about anything postwar is further minimized by the fact that current planning and research are being carried on by the old timers who yelled their heads off in the pre-Pearl Harbor era for a Federal policy that would provide air supremacy. We all know what happened. Airmen were boobs — until the fall of Poland and France. That's all history now, but anyone who would minimize the necessity for pouring the concrete now upon which to erect the aviation structure in the future, is, in our opinion, a little off the beam. They have failed, as their prewar counterparts failed before them, adequately to estimate the true importance of air power in this war and its vital role in the maintenance of peace when peace comes.

Go back a few years and dig into the files of our reputable aviation trade magazines. Start with the cancellation of the air mail contracts in 1934 and run on through the period to Pearl Harbor. If you don't get sick from reading in the record the treatment handed domestic aviation during that era, you have a cast-iron stomach. You will be impressed with the discovery that men of vision and advocates of air power had little or no influence on those who wrote the law. As a result we could not establish and even now do not have a clear-cut, vigorous Federal air policy conducive to strength in the air and to a healthy aviation industry. Now, with our friends in Congress more legion and with public interest and demand behind our aims, plans made today have a better chance to become realities tomorrow.

Aviation Legislation

When one speaks of aviation planning, it is paramount, if not absolutely necessary, to begin with Federal policy —*ergo* legislation.

About a year ago Representative Clarence Lea of California introduced a Bill in the House to amend the Civil Aeronautics Act of 1938. Revised many times since its introduction, the proposed legislation split domestic aviation interests into two opposing camps and precipitated what might be termed aviation's first civil war.

In our opinion the Lea Bill is now a dead duck. The Rules Committee last month refused to release it to the floor of the House. That means it won't get to a vote and the odds are a hundred-to-one it never will. But the Lea Bill almost made the grade. Its proponents were very clever and versed in the mechanics of politics and legislation. Fortunately for all of us, including the scheduled air transport industry who fought staunchly for its passage, the Lea Bill has been stopped in its tracks. But that's only the first round. Where do we go from here?

As one of our friends recently pointed out, "The next portion of the job is going to be, if anything, harder than the first task, since it is more difficult to build in many instances than it is to tear down."

The Lea Bill was an ill wind, blowing a lot of good the entire industry can profit from because it made everyone "legislation conscious." People woke up just in time to mass their strength and knock the demon in the head. They are staying awake now and are making a timely and sincere effort to bring all branches of aviation together in hopes that through conference, study and open-minded discussion, we can sit down and draft sensible proposals that will promote and protect the interests of *all* branches of the family and simultaneously provide the legislative groundwork for a healthy postwar future.

The first meeting took place in Washington in January. All organizations were represented with the exception of AOPA who sent "regrets." (AOPA is supposed to represent the interests of private flyers and their absence demands an explanation.) The Air Transport Association was represented and dissented on the majority of the decisions reached by the group. A Joint Aviation Legislative Committee was established and all aviation organizations have been asked to appoint one representative and one alternate for another Washington conference to be held in the near future.

If this committee can accomplish its purpose and unscramble the mess which developed over the controversial Lea Bill, coming out with constructive suggestions for an aviation law that will be acceptable to all, we would not be averse to passage during the war years. But remember this —the Act of 1938 was a good law overall until President Roosevelt in his reorganization order decimated its authority and placed civil aviation back into the Department of Commerce — a decree which gutted the Act and destroyed its original purpose. Had it not been tampered with

there would be little complaint now over Federal aviation policy.

It seems that aviation's unfortunate fate is to go forward two miles and get pushed back three every couple of years. And the strongest reason now for seeking new legislation and getting back on the beam is because domestic aviation has continued to be kicked around at will by Federal bureaus, departments and agencies from one end of Pennsylvania Avenue to the other so long that any attempt toward progress or expansion is stopped before it gets started—stopped by a maze of red tape unparalleled in bureaucratic history. The slow and tedious process that men of action must go through kills all incentive and desire to advance commensurate with the needs of the hour.

Independent Department Needed

We hear on good authority that Senator Pat McCarran of Nevada, who was a power behind the benevolently inclined but poorly administered Civil Aeronautics Act of 1938, hopes and proposes to develop and sponsor a sound, integrated program of legislation which would solve the numerous impending and anticipated postwar problems of aviation. Perhaps it would be well if the Joint Legislative Committee of all American aviation organizations sat down in conference with Senator McCarran in a sincere attempt to begin anew and give us the type of legislation every airman knows we must have if we are ever to achieve any measure of stability and the opportunity to progress in direct proportion to economic necessity and defense requirements instead of in accordance with the whims of political appointees.

Should this approach fail then it would be far better to let matters alone than to pass any legislation like the Lea Bill. Remember, Lea's masterpiece of confusion is merely an amendment to a former law that has been badly administered. And why amend something that the President, through his wartime powers, has already rendered impotent? Why not attempt to go whole hog and set up an independent department of civil aviation? We might even get somebody like Jimmy Doolittle to head it up when he gets home. And it's not too early to make plans now for the day when our fighting men return victorious from the battle, a couple of million of them in fact with the greatest composite aviation experience in history, surpassing anything the wildest dreamers from Leonardo to Tennyson, from Billy Mitchell to Sascha de Seversky could conjure up from their fertile and imaginative brains.

They Will Come Home

Fact is, too little consideration is being given our fighting men in the postwar planning sessions we've been privileged to attend. Unless they can return to a land of opportunity, where exists a national economy that will permit them to translate literally the constitution's reference to life, liberty and the pursuit of happiness, then surely they will have fought in vain.

What can we do now to guarantee they won't have to come back to a WPA pick and shovel gang, live under an economy based on scarcity, operated by a government run by decree?

So all postwar plans must first set their sights on establishing a strong, stable industry out of the war-inflated gargantua we now have if we are to create and preserve opportunity for the veterans of this war. At this writing both industry and government have turned out some interesting and intelligent suggestions but we are a long way from putting sound ideas into concrete form. Government shortsightedness, unless corrected, will bankrupt the aviation manufacturers. The tax and renegotiation systems while favorable to old, established industries, penalize the aviation industry merely because it's a *young* industry! Unless present practices are revised, there will be no aviation industry for our fighting men to work in when they return.

Postwar financial reserves must be allowed; for without them, the transition from war to peace will require years instead of months — years of chaos in and finally disintegration of the most vital industry upon which we shall primarily depend for the maintenance of world peace and security. Such conditions, if allowed could easily become the one final tragic blunder of all Western civilization. If you think this might be an extremist point of view, just sit down and ask some of our combat pilots returning from the battlefronts. Or ask the Russians.

Fortunately, one phase of legislation affecting war veterans is now in the congressional mill. Known as Senate Bill 1617, it will provide Federal Government aid for the readjustment in civilian life of returning World War II veterans. One of the provisions empowers the Veterans' Administration to provide education and/or training, including such vocational, professional, and/or technical refresher courses as may be approved by the Administrator. This should put some constructive ideas into the minds of our great aviation training executives who soon will have adequate facilities available for such a program. But Congress seems to be putting the cart before the horse—of what use would be an aviation training program for war veterans if there's no place for their required talents upon completion of their training? That is why a complete revision of present legislation must be made to guarantee a stable industry when peace does come. The precarious financial position of the aircraft industry was forcibly described in the January SOUTHERN FLIGHT. ("Congress Can Prevent Aviation Bankruptcy," by Lucien W. Shaw, pp 28-30 et seq). No remedy is yet in sight.

—CAA Photo.

MOBILE CONTROL TOWER developed by the Civil Aeronautics Administration in collaboration with the Army is operated by two men, self-sufficiently incorporates a 5,000-volt power plant, and has six intermediate frequency receivers, four ultra-high frequency receivers, a low frequency transmitter and an ultra-high frequency transmitter.

Lack of Unity

Right now, every branch of aeronautics is more interdependent than ever before in history. Yet paradoxically, never was there such a paucity of unity and co-operative action. Every branch of the family has its own little bailiwick and its own trade association. What we need most of all right now to force through the constructive kind of legislation so urgently needed is an actual operating liaison between all phases of aviation enterprise, and especially between all aviation organizations. Give it any name you like but get one organized.

With the single exception of technical and engineering organizations, selfishness and self-interest has dominated the aeronautical scene during the past few years of metamorphosis and evolution from the fortieth industry in size to top position in the

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AIR POWER IN ACTION

(Continued from page 30)

The record of air power during January shows that day is not far off.

Europe

Seven days after General Arnold's report was made public, the 8th Army Air Force in England staged the greatest air battle ever waged. Over 700 heavy bombers, escorted by 600 fighters on various stages of the operation, struck in daylight at the heart of Germany's aircraft industry. Their targets, deep in the enemy homeland, were Focke Wulf, Messerschmitt and Junkers aircraft assembly plants and engine shops, together with vital communications, in five cities — Brunswick, Oschersleben, Halberstadt, Bielefeld and Meppen. The Germans, commented General Arnold later, were trying to increase production at the plants, but now they were "wiped out altogether." While the heavy bombers thus destroyed German fighter strength before it could rise to meet our air units, they and their fighter escort simultaneously shot down a total of 152 fighters. From 800 to 1,000 German fighters—about half the total number guarding the West and the greatest number yet to challenge the 8th AAF — fought to guard the vital production centers. They shot down sixty heavy bombers, which tied with the toll at Schweinfurt last October to represent the largest loss on a single mission yet suffered. Five U. S. fighters were lost.

The five-pronged assault followed announcement earlier of a new "seeing eye" technique by which the 8th AAF can now bomb through heavy cloud cover. It should be remembered, however, that such bombing does not offer precision against individual targets, but parallels pattern bombing, which the U. S. Air Forces employ only for specific purposes. One of these is to effect constant harassing when weather prevents precision bombing. In this connection the 8th also has revealed it now possesses large numbers of standby crews, which can operate while others rest and thus keep the assault rolling to best advantage against German pilots who will soon be spending more time aloft without rest than efficiency can stand.

While the 8th AAF quickened its raids against Germany in daylight, the RAF has stepped up its night assaults. Berlin, first bombed heavily last November 18, had received 18,000 tons of bombs on January 20 when the RAF delivered its eleventh major bombing and set a new tonnage record — 2,575 long tons. RAF observers estimated 40% of the capital's essential area had been obliterated.

LOSSES IN THE AIR WAR
January 1-25, 1944
(Does Not Include Probables or Damaged Totals)

Date	European Enemy	European Allied	Italy Enemy	Italy Allied	Southwest Pacific Enemy	Southwest Pacific Allied	Pacific Enemy	Pacific Allied	Russia* Enemy
Jan. 1	....	28	....	....	....	....	....	....	11
Jan. 2	8	27	....	2	24	....	10	....	9
Jan. 3	2	27	7	3	32	....	....	1	36
Jan. 4	17	26	2	....	12	....	....	....	30
Jan. 5	98	52	....	1	17	4	....	....	19
Jan. 6	45	25	2	0	19	2	....	....	51
Jan. 7	2	4	6	4	....	....	....	....	28
Jan. 8	1	1	12	3	12	2	....	....	57
Jan. 9	2	3	1	1	10	7	....	....	32
Jan. 10	....	....	37	3	10	2	....	....	....
Jan. 11	152	65	11	7	20	4	....	1	36
Jan. 12	....	....	12	3	2	0	....	....	122
Jan. 13	8	2	10	5	2	0	....	....	37
Jan. 14	27	54	4	5	14	0	....	....	42
Jan. 15	1	....	3	2	2	0	3	1	....
Jan. 16	1	....	18	15	36	10	2	1	39
Jan. 17	....	....	....	....	22	1	....	....	33
Jan. 18	....	....	7	3	3	....	6	4	11
Jan. 19	2	....	3	2	20	13	....	....	17
Jan. 20	36	....	5	2	34	5	....	2	....
Jan. 21	73	42	20	5	5	2	....	....	18
Jan. 22	....	....	15	9	18	6	3	....	12
Jan. 23	5	2	11	3	1	....	3	....	45
Jan. 24	24	13	15	11	52	14	5	....	71
Jan. 25	....	2	11	3	65	5	2	....	49
TOTALS	504	373	212	92	432	77	34	10	805

CHINA: Seven enemy planes destroyed at loss of 2 allied planes.
SOUTHEAST ASIA: 25 enemy planes destroyed at loss of 15 allied planes.
*RUSSIA does not reveal its own losses.

Both the 8th and the RAF continued their heavy assaults against the invasion coast, and other aircraft production centers throughout Western Europe were bombed frequently.

Germany and the Balkans, as well as Southern France, were brought within the range of more strategic air power during the month when the 15th U. S. AAF moved into Italy where the 12th AAF had based for some time. Lt. Gen. Ira Eaker, transferred to command all Mediterranean air operations when Lt. Gen. Carl Spaatz succeeded him in England in preparation for the invasion, was expected to step up the air war in that theatre. Sofia, the capital of Bulgaria, was raided several times, as were aircraft plants in Austria.

Italian Front

In Italy, bad weather early in the month restricted air operations to occasional fighter-bomber assaults against gun positions, railways, roads and coastal areas. But in the third week the weather cleared and air action was intensified both on the battlefront, where gains were hammered out by ground forces of the American 5th and the British 8th Armies, and to the rear, particularly in the vicinity north of Rome and southwest of the city, where the German Air Force headquarters was destroyed by low-flying fighter-bombers. Glider-bomb and torpedo plane bases in Southern France were attacked heavily. Seven German airfields near Rome were neutralized. Finally, by January 22, the area had been prepared for one of the biggest surprises ever handed the Germans in Italy. Fifth Army units were landed at several points below the Tiber River and converted a wide bridgehead into a deeply fortified position before meeting serious opposition. Fourteen hundred aerial sorties were flown in the area during the landings. In the same period the Luftwaffe managed only 100 sorties, its squadrons having been bombed out of their operational bases and forced to use temporary fields.

Balkans

The Middle East, where threats of invasion have recurred frequently, remained relatively quiet in bad weather. RAF units raided shipping off the coast of Greece on several occasions, however, and sent many enemy ships to the bottom. Shipping in that area had been reduced to the use of old sailing vessels, dozens of which made easy prey, since the Axis was driven from North Africa. Incidentally, RAF figures announced last month showed that between 3,500 and 4,000 German and Italian planes were destroyed in North Africa during 1943 by the

(Continued on page 50)

HIGH SCHOOLS GET SURPLUS PLANES

CHANNELING of surplus or obsolete Army airplanes, engines, airframe parts, and instruments to schools teaching aeronautics is the latest service to aviation education by the CAA pre-flight aeronautics program. Equipment which was cluttering up valuable space at Army depots or being sold for scrap is now moving into classrooms and laboratories for a long and useful "old age," through the efforts of CAA's aviation education service staff.

Requests from 824 schools, in every state but Florida and Arkansas, had been processed by the staff as of January 10, according to Director Bruce Uthus. Leading in number of requests are Pennsylvania, New York, Texas, Ohio, Wisconsin, Kansas, California, and New Jersey. As a result of applications made through CAA, the Army has already offered to the schools at no charge except the cost of shipping 269 engines, seventy airplanes, and fifty consignments of miscellaneous equipment, such as landing gear and instruments.

The CAA has also arranged the servicing of about 125 similar requests by the Navy Department.

Typical of comments received from educators on this service are these:

"Nothing better could be done to stimulate pre-flight classes than this program of furnishing the type of equipment which is being offered."—P. A. Wright, Superintendent, Snohomish Public Schools, Snohomish, Washington. "We appreciate very greatly this opportunity of getting these materials which we have needed badly for several years."—Rev. Adrain W. Conrad, St. Joseph's College and Military Academy, Hays, Kansas.

How to Obtain Gifts

Application forms for equipment are distributed by CAA through state education authorities, the completed blanks reviewed by CAA, and then turned over to the Army. The CAA review makes sure that the requests are reasonable — one school with thirty aeronautical students, for example, asked for ten planes. CAA has arranged a procedure whereby the schools are informed on weight and shipping point, so they can estimate freight charges. In this way it avoids the possibility of a school being confronted with a freight bill beyond its means, as might occur in the case of a bomber, which fills three railroad cars.

Acting as procurement agent for demonstration equipment is only one of many steps taken by the CAA to promote aviation education. Its program—which is operated, incidentally, by only four full-time professional workers — began in March, 1942, with the sponsoring of a project for preparation of texts and teaching materials, and the calling of a nation-wide series of conferences of educational authorities on the need for introduction of aeronautics studies in the schools. Next move was to open the doors of CAA pilot training ground school courses to teachers, for whom special training classes later were offered. More than half of the nation's 28,000 high schools were teaching 250,000 students the fundamentals of aeronautics within a year after these pioneering activities were undertaken by the CAA, and by now the coverage is considerably higher.

The CAA pre-flight program has a double-barrelled aim. As the name implies, it is designed to prepare boys in the upper grades of high school for service in the Air Forces, should the war last long enough. "In every case, thus far," reports Thomas W. Watkins, supervising principal, Coopersburg, Pennsylvania, School District, "we have had word from them at their training centers that their pre-flight program had proven of great worth to them." At the same time, it seeks to condition all high school students for life in an air age, in the same way that chemistry gives them background for the world of today regardless of whether they plan to be chemists.

The small CAA aviation education staff, aided by leading educators who are employed from time to time on a per diem basis, is concentrating now on helping the schools to improve the techniques of teaching this relatively new subject. Regional institutes have been held throughout the country for the exchange of ideas and experiences (at one of them was witnessed the remarkable spectacle of students telling their principal they wanted more work — but only in aeronautics). The American Council of Education has been called in to make an evaluation study of results to date in a group of representative schools. A manual showing teachers how to make laboratory equipment out of readily available materials has been drafted under CAA sponsorship by researchers at Wayne University, Detroit, and Miami University, Oxford, Ohio. Finally, teachers of aeronautics are being brought together at various central points with CAA officials who operate the airways, build airports, train pilots, and enforce safety regulations, to give them a better understanding of practical aviation problems. ★ ★ ★

Why Not a Warplane for Every School?

Surplus Army flying equipment has already gone into 824 high schools. That leaves 27,000 more to be equipped — a great opportunity to convert scrap into scientific advancement and aviation expansion.

PEELING A PROSPECTIVE PLANE SKIN. Will this aluminum sheet be shipped as such or, will the plane manufacturer who ordered it save valuable man-hours by having it prefabricated into a complete plane part by skilled Reynolds workmen?

NO LOST TIME when you use Reynolds Prefabricated Plane Parts. Completely finished parts can go right on the assembly line as soon as they are received at your plant. This modern method, pioneered by Reynolds, saves you manpower, plant space, time and scrap.

. . . when you use REYNOLDS complete prefabricated Plane Parts Service

- *SAVES MANPOWER*
- *SAVES SPACE*
- *SAVES TRANSPORTATION*
- *SAVES SCRAP*

From our global battlefronts come the never-ending pleas, "Give us more planes, better planes". . ."deliver them faster." In the face of this, fabricating aluminum sheets into plane parts in your own plant takes manpower you can ill afford to spare.

By using Reynolds prefabricated plane parts service you can use all of your manpower to build planes.

- It saves you manpower because every aluminum piece you receive is a finished part, ready for immediate assembly.
- It saves plant space because you do not have to maintain excessive stock piles, do all your own fabricating or store and segregate your own scrap.
- It saves on transportation because it releases freight cars needed to haul scrap metal from your plant.
- And it saves on scrap because the 30% of every aluminum sheet that becomes scrap is refabricated in our plants in a matter of hours instead of months.

Reynolds finished parts saving thousands of man-hours

Airplane labor amounting to thousands of hours is being saved by Reynolds prefabricated plane parts. In fact, Reynolds, the first aluminum manufacturer to furnish complete plane parts from aluminum sheet, is supplying complete parts to every leading manufacturer of combat planes.

It is this trait of daring to lead, daring to be different, that has spurred on Reynolds, in 4 short years, to where its operations now cover 40 plants in 14 states, plus its own source of Bauxite from which aluminum is made. This urge to constantly move ahead is what keeps Reynolds men on a ceaseless search for new ways to make aluminum better . . . make it easier and cheaper to use.

Take advantage of Reynolds' resources, equipment and engineering skill. For any problem you may have in working with aluminum, no matter what it may be, you'll find Reynolds able to handle it in the most practical way. Reynolds Metals Company, Aluminum and Parts Divisions, Louisville, Kentucky.

REYNOLDS METAL

REYNOLDS *The Great New Source of* **ALUMINUM**

INGOT • SHEET • EXTRUSIONS • WIRE • ROD • FORGINGS • TUBING • FOIL • POWDER

THE Sky's the Limit

BY BILL GREEN

Evaluating jet propulsion. . . . How jets differ from rockets. . . . Many possibilities for reaction engines. . . . Balancing airport plans with needs. . . . Traffic need not congest fields — if controlled.

WE have lately heard much of rocket and jet-propulsion aircraft, and it may not be amiss at this time to attempt to evaluate their prospects.

Few people seem to understand the old law of physics and motion that "to every action, there is an equal and opposite reaction."

Whenever you shoot a shotgun, rifle, pistol, or any other kind of gun, there is always a kick-back. There is no such thing as a kick-eliminator if the gun goes off. There may be rubber shoulder pads, shock absorbers, or some such thing, but the shock is always there. The equation that expresses the force required to project the load, or projectile of a gun forward, is $F = \frac{1}{2}MV^2$ Where F is the force, M is the mass of the projectile and V is the velocity. It may, therefore, be seen that any force is capable of projecting any mass at a certain velocity. If the mass is larger, the velocity with the same force must be considerably smaller. Whatever force is required to project the bullet forward is also found in exactly the same amount in the kick-back of the weapon. Naturally, since in almost every case the mass of the weapon is very much greater than the load, the kick-back in velocity is very much less than that of the projectile.

This law holds true in all sorts of reciprocating engines, etc. One example you probably never thought of was that every time an automobile, or a train, or a tractor, or even a person, moves over the face of the earth, it imparts some slight force and, therefore, movement of the earth in the opposite direction. If all the people on earth, and all the machines on earth, could be pointed in the direction of the rotation of the earth, and would be started up and run at a constant speed for a long enough time, the equal and opposite reaction would eventually slow the earth speed down, and thus we might some day be able to get twenty-four hours of daylight if we wanted to make that much effort.

Most everyone is familiar with an ordinary skyrocket. In a skyrocket, a cylinder open at the rear end, or bottom, and closed at the forward end, or top, is filled with a fairly slow-burning explosive mixture which contains all of the elements required for combustion. When combustion starts, the hot gases created by the combustion relieve their pressure by exuding from the open end. The equal and opposite reaction to this is what pushes the rocket upward or forward. The faster the combustion takes place, the faster the rocket will move because of the greater force expelling the gases. In order to get more lifting ability, it is necessary to have more charge in order to expel more gas at the same velocity. The opposite reaction will give the effect of more lift. In the ordinary skyrocket, not much effort is made to direct its trajectory, or path. However, if one were made as carefully as some model airplane builders build their craft, it might be possible to have it fly in a straight line for a considerable distance.

The greatest difference between a rocket plane and a jet-propulsion plane lies in the fact that whereas rockets carry all their own combustible mixture, the jet-type of propulsion mechanism consists in taking in outside air and mixing the air and the fuel, which the plane carries, in the jet itself while the combustion is taking place.

For most combustible mixtures, the air used to oxidize or consume the solid fuel is usually fourteen to twenty times in weight the mass of the solid fuel itself. That means very simply, then, that the fuel load that might be carried by a jet-propulsion aircraft would be fourteen to twenty times as great as could be carried by a rocket type. This is also true of the conventional gasoline engine aircraft we have at present. They carry only the gasoline and take air from the atmosphere in which they are flying to mix with the gasoline to form the combustible mixture. If an aircraft carried some mixture such as is used in rockets, such as, for example, black powder which would be introduced in charges into the cylinders, it probably would only be able to carry about one-fourteenth to one-twentieth as much fuel in BTUs as at present.

The actual design of a rocket plane, however, is very much simpler than that of the jet-propulsion craft. In the rocket cylinder, the slow-burning fuel is already in place and nothing is required except to start the combustion process. In the jet-type engine, however, both fuel and air must be constantly injected. It means, therefore, that during the period of starting up and attaining speed, the jet mechanism requires a compressor capable of putting in a large volume of air at a pressure somewhat higher than the pressure of the hot gases inside the jet chamber. Other than this compressor and a fuel pump which would inject the gasoline into the chamber under pressure, no other mechanism would be required for the jet-propulsion type. It is possible that at high speed some of the pressure required could be taken from the air. However, this requires the same horsepower as though the air pressure were produced locally inside the airplane. Therefore, it will become a question of which is the safest and most economical in the long run. Some engines and compressors, however, will be necessary for starting, at least. In order to drive the compressor and fuel pump, very likely an engine will be required. However, it might be of an auxiliary nature similar to some of the auxiliary power plants presently used in the larger aircraft.

Quite possibly somewhere down the line, a jet supercharger may be developed similar to the GE exhaust

(Continued on page 40)

Fledgling Flyers Today... America's Airmen Tomorrow!

Hundreds of Aviation Cadets are moving onto "the line" in their flying togs every day at Georgia Air Service Schools.

The boys you see here will one day be writing back as others are already doing —from combat fronts— thanking their Georgia Air Service instructors for their solid foundation in flying technique!

THE actual flying instruction of an Aviation Cadet . . . and the long hours of academic work in the class room . . . are backed up by a program of military drill, athletics and precise Army discipline . . . qualifying Aviation Cadets for the Army Air Forces. A complete staff of Army officers cooperates with our large organization of trained personnel at each of the Primary Training schools operated by Georgia Air Service, Inc. Life in a Civil Contract school is one of a highly organized routine from dawn to dusk . . . with morale high and a spirit of teamwork and comradeship which is instantly recognizable as an outstanding American characteristic contributing to the success of our Armed Forces.

★ ★ ★ ★ ★ ★ ★ ★

Photographs made at Georgia Air Service, Inc. schools; approved for publication by Bureau of Public Relations, War Department, Washington.

GEORGIA AIR SERVICE

GEORGIA AIR SERVICE, INC.

ATLANTA, GEORGIA

Flight Contractors to U. S. Army Air Forces, Bennettsville, S. C., and Jackson, Tenn.

This advertisement is one of a series which is appearing in national magazines and newspapers as Consolidated Vultee's contribution toward a clearer public understanding of transportation's role in the war, and its postwar opportunities and responsibilities.

"Axis air base falls to Allies"... Now what?

WHEN YOU READ that Allied paratroops have captured another enemy air base, don't be too quick to say, "Now, by using this new base, our bombers can strike even deeper into the heart of industrial Germany."

It's not quite so simple as that. An Axis air base doesn't become an Allied air base merely because it has been wrested from the enemy.

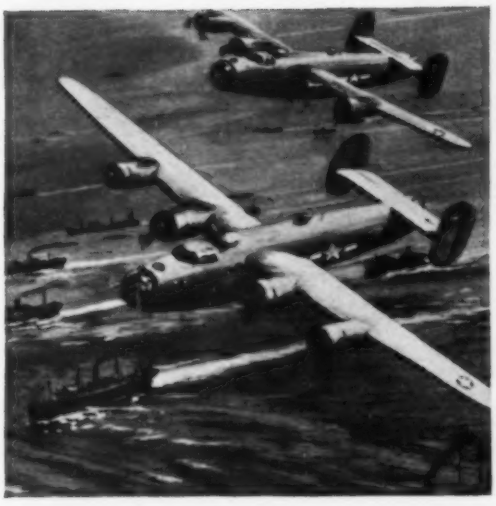
Before a single bomber can take off with its load of block-busters, there is a colossal job to be done — a job which requires the combined efforts of the airplane, the truck, the train, and the ship. That's something the communiques never tell you about . . .

1. First come the air-borne reinforcement troops, landing on the bomb-pocked runways. Then a second wave of planes, carrying an aviation engineer battalion, "pee-wee" tractors, scrapers, and lightweight construction equipment. An emergency landing strip is smoothed off for fighter planes, and transport planes with heavier tractors, scrapers, and rollers.

2. Then, the trucks come in, with gasoline and oil drums, bombs, and food. Others lug in heavy cement mixers, giant bulldozers, and tumble-buggies — so that the engineer battalions can build permanent runways for all-weather bomber operation. By this time, transport planes have flown in carrying operational personnel, radio equipment, spare bomber engines and parts.

3. Now the heavy sluggers roar in — the big, long-range Liberators and their crews. Transports fly in, too, bringing the ground crews who will ready the bombers for action. At last — perhaps weeks after the air base fell into our hands — the Bomber Command is ready to strike. How hard can it strike — and how long? That all depends on the vital link in the chain . . .

CONSOLIDATED VULTEE



4. This link is the never-ending stream of cargo ships. For the problem of supply cannot be solved by air alone. Transporting the equipment needed to *keep* a bomber base in operation is a job in which everything that rolls, floats, and flies must join forces.

The way this challenge has been met is more than a heroic saga in the tightening of the air ring about the Axis. It is a lesson we must remember for the peacetime years that lie ahead.

5. An enduring peace will depend, in great part, on the unhampered interchange of people, goods, and ideas between the nations of the earth.

And while all forms of transportation are teaming up to meet this postwar challenge, the plane, for one, must play a second, and possibly an even more important role: *that of policing this 60-hour-wide world.*

For the maintenance of an adequate Air Force, for years to come, will be one of the cheapest premiums America could possibly pay for insuring the peace which we shall have won.

Quick Facts for Air-Minded Readers

No ice needed — *Much of the nation's perishable commodities, such as fish, fruit, meat, and flowers, may be transported by air, someday soon. In a plane flying above 20,000 feet, no refrigeration would be required.*

• • •

Speed, not cost — The Air Transport Command, using such planes as the huge, long-range Liberator Express, is daily flying hundreds of tons of vital equipment over our global skyways. Speed, not cost, is the all-important thing when our fighting men need blood plasma, more ammunition, or replacement parts. By plane, they get these things in a matter of *hours*, not days or weeks. In the postwar period, as planes are still further improved and new economies are effected, low rates will make commercial air freight practical for many products.

• • •

Exit the iron horse? "I have no illusions that the airplane will make the railroads obsolete. On the contrary, there will be room and plenty of need after the war for more and better transportation by rail, highway, water, and air." — TOM M. GIRDLER, Chairman of the Board, Consolidated Vultee Aircraft Corp.

No spot on earth is more than 60 hours' flying time from your local airport

From Flying Jeeps to Leviathans of the air — *Consolidated Vultee now builds many types of war planes, from small trainers to long-range bombers. When peace comes, the company will be in a position to provide the postwar equivalent of such planes, from small privately owned "air flivvers" to huge transoceanic passenger-and-cargo planes.*

LIBERATOR . . . 4-engine bomber

LIBERATOR EXPRESS . . . transport

CORONADO . . . patrol bomber

CATALINA . . . patrol bomber

VENGEANCE . . . dive bomber

VALIANT . . . basic trainer

RELIANT . . . navigational trainer

SENTINEL . . . "Flying Jeep"

AIRCRAFT

San Diego, Calif. · Vultee Field, Calif. · Tucson, Ariz. · Fort Worth, Texas · New Orleans, La. · Louisville, Ky. · Wayne, Mich. · Dearborn, Mich. · Allentown, Pa. · Nashville, Tenn. · Elizabeth City, N. C. · Miami, Fla.

Member, Aircraft War Production Council

SKY'S THE LIMIT

(Continued from page 36)

supercharger presently used on some of the larger aircraft. This would be capable of pushing in plenty of air at the proper pressure and if some sort of starting equipment were kept at the ground or base station, it might not be necessary to have an engine-driven compressor aboard.

What this all adds up to, to us, is the possibility that some day there may be a jet-propelled aircraft with no spark plugs, carburetors, pistons, connecting rods, crankshaft, propellers, control-mechanism, etc., which certainly should result in a much lighter aircraft, and considerable economy. Few people realize that a considerable amount of the fuel presently used in almost all engines is consumed in simply overcoming the friction of the engine. If you want to see how that is, try to turn over a big engine by hand. The superchargers alone on some of these larger engines require much horsepower. The electrical equipment, accessories, etc., require several additional horsepower all of which must come from the engine which also propels the plane in most cases.

It is frequently interesting for us to recall how many years certain projects have been in their development stages before they are made available to the general public. We recall reading in the "Denver Post," sometime in 1914 or 1915, an article including a picture of an engine weighing less than 100 pounds which developed more than 100 hp. Such a weight-to-power ratio in the lighter engines has never been obtained commercially. With the jet-propulsion method it is quite possible that equivalent hp weight-ratios, or even better than one-to-one, might be obtained. Another development that has taken a good many years is the turbo supercharger recently put into use on many of the aircraft engines. This turbo supercharger was forecast by one Nikola Tesla sometime in the periods of 1915 to 1919-20. Although the principles were well known and are almost identical with those used in the present turbo superchargers, there were no suitable materials that would stand up and give the kind of service required. It has taken many years to develop the materials that are presently used. It is understood that even these are not as good as they should be and that certain parts have to be replaced rather often. The same would undoubtedly be true of all the materials used in the jet-propulsion engine. These materials would all be operated at extremely high temperatures, and if any coolant other than air would be used, this would result in an increase of weight and some of the efficiency would be lost.

As long as we are dreaming about these things, we might consider some of the possibilities of jet propulsion. The Buck Rogers boys continue to show rocket ships, etc., in which the rockets can be turned downwards, thus permitting the airplanes to take off straight up. Some sort of deviating devices might be put on the jet so that some lift could be obtained at the same time as forward speed was being gained, thus helping the thing off the ground in a considerably shorter space than normal. Also, there might be some possibility of using multi-chambered arrangement similar to some of the anti-aircraft guns now in use, with some very simple, easily operated valve mechanism which would load each chamber with air from the outside when the plane was in motion, thus eliminating any compressor at all.

There is certainly no telling along what lines this thing will develop. But it looks like a far more promising development than anything else that has happened lately. The advantages in first cost, weight saving, freedom from overhaul difficulties, etc., might be tremendous. It might well be that this will be the propulsion for that mythical, postwar, foolproof airplane for everybody.

★ ★ ★

About Airport Planning

On a trip we made several days ago, we saw about twenty new airports in a comparatively small area. A number of these airports had beautiful, wide, paved runways, running in every direction, and they were at points never used before this war. A number of them are situated adjacent to thriving small towns and there are so many constructed by the Army and Navy for war training purposes that certainly they will never be continued for those purposes during peace times.

For the last several months a large Oklahoma town has been raving about building a $25,000,000 airport. Another Oklahoma town of approximate-

(Continued on page 42)

Makers of Precision small parts for the Aviation Industry
★ ABILITY ★ PRECISION ★ PRODUCTION
DOLAN AIRCRAFT MANUFACTURING COMPANY
DALLAS, TEXAS

OFFICIAL U. S. NAVY PHOTO

Out of the Mouths of Ugly Ducklings

FROM ATTU to Africa, from Kiska to Sicily, from Munda to New Britain, LSTs, vital units of America's great fleet of landing craft, have won laurels in a new art of warfare.

These "Ugly Ducklings," as they are known affectionately to the men who work them beachward in the face of enemy gunfire, are one of the most startling types of ship the war has produced.

Born of American ingenuity along the banks of the Mississippi, the LST (Landing Ship, Tank) was only on the drawing boards a mere two years ago. The first model was completed in October, 1942. Yet so vital are these "Ugly Ducklings" in today's amphibious warfare that production of landing craft has been given an overriding priority over all other urgency programs.

Knowing the vital importance of absolutely accurate navigation and trustworthy steering, our Navy equips every LST with the Sperry GYROTRONIC Compass, the famous Mark XIV. And as a result of experience gained in Africa and in the Pacific, the Sperry Electric Follow-Up Steering Control is specified for those currently being delivered to the Navy.

Such large numbers of these two precision devices (designed, developed, and manufactured by Sperry) are now being used that no one company can possibly produce them all. So, Multiscope, Inc., of Coffeyville, Kansas, is making the complete Steering Control for Sperry under subcontract, while the Dodge Division of Chrysler Corporation is helping to supply quantities of Sperry Gyro-Compasses, under prime contract to the Navy.

TODAY, this minute, these gallant LSTs are making history . . . landing tanks and men on enemy-held beaches . . . and landing them exactly where and when they are scheduled to be landed.

SPERRY GYROSCOPE COMPANY, INC.

BROOKLYN, NEW YORK

SKY'S THE LIMIT

(Continued from page 40)

ly the same size has not been raving at all, but has an airport the equivalent of that $25,000,000 one, but it only cost all together around $7,000,000. We just wonder what those people are going to do with the other $18,000,000.

This whole airport situation boils down to this: There are very few, if any, airports that have paid dividends. Now, we know that many people have operated airports for the purpose of a flying school or some other such business, and we know the airlines in a few places have operated airports for the purpose of having landing areas available and the overall operations paid off. But we owned an interest in a large commercial airport with three hangars and some sixty or seventy planes regularly operating therefrom, and we know that never did we receive any dividends of any kind nor did the thing make enough money to pay living wages to the help, or to provide additional facilities that were required. We will admit that it came very close to doing what we needed, being meticulously managed, but it would have required considerable more storage and gasoline sales and mechanical work to have made much additional revenue which could have been utilized for those purposes.

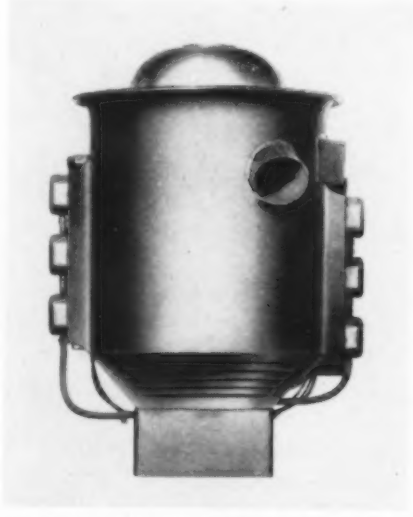
We think that hangar storage and aviation expenses are already too high to fit the general public. We know that there will always be a lot of people who will buy expensive airplanes and will keep them in hangars at $30 and $40 per month storage, but the very storage fee of $20, $25, or $30 per month is enough to stop the bulk of the American public from ever owning an airplane. Therefore, we think that in place of boosting the storage prices, we should attempt to work out ways and means of reducing those prices so as to draw a great many more people into aviation. The same policies pursued by Woolworth, Kress, Penney, and other people, including Henry Ford, of giving the people the most you can for the least money and making a very small profit on a great number of sales, is still the best policy and will work for aviation, too. What we must do is reduce the cost of aviation to everyone and get a great many more people into it.

Consequently, I was rather violently opposed to the building of another *municipal* airport in the city of Tulsa when, in fact, they already have a marvelous municipal airport available to all the public and which is utilized nowhere near 100 per cent capacity.

The planners insisted, however, that in the future Tulsa would probably have as many as 500 private planes (this would be at least seven times the largest number thus far enjoyed) and that 500 private planes would overload all the airport facilities presently available. Let's examine those figures. One of the large aviation schools with which we are acquainted has 500-and-some-odd Army airplanes which take off every morning and land every afternoon. They leave and go to nearby practice fields from which they fly all day. These 500 airplanes clear the ground in approximately an hour each morning and get back on in about an hour each evening. I have had the misfortune a time or two to take off during the period that they were getting off and have never been delayed more than twelve or fifteen minutes. Several times I have come in when they were landing and have taken my turn, never having to make more than one extra circle around the field. I will say right now that this little extra inconvenience is nothing like the inconvenience of having to pay the taxes which would result from building an additional $7,000,000 airport at each town in the country. In addition to those 500-and-some-odd airplanes operated by the school, three different airlines run several trips a day in and out of the airport, a tremendous aviation manufacturing concern builds airplanes which are all tested from this same field, and a great number of Army planes come in and leave every day, and forty or fifty private airplanes are operated from the field more or less regularly by private owners. Yet, by actual count, as many as thirty minutes pass during the day in which no airplane takes off or lands at the field. It, therefore, would seem that about 600 airplanes or more using the field daily do not overload it by any means. In view of the fact that the field has duplicate runways in every direction, and in view of the fact that it is at present raising a new crop of sod and does not permit landing except on runways, it would appear that when the sod is in good shape and all parts of the field are available and usable, that this field could take care of 1,000 or 1,500 airplanes with very little inconvenience to anyone.

We happened to be stationed on a flying field for some twelve months in which we got to watch the operations day after day from our office window. What we saw was this: That two airlines made their daily flights, one private aviation school operated about seven cubs day after day, two cotton dusters flew into the field daily as their base, two flying clubs composed of about seventeen members each did a considerable amount of operating, the Coastal Patrol operated thirty planes with a minimum of twenty flights each day, including test hops, and the Army and Navy dropped in every once in a while, in addition to which there were about thirty or forty private operators who constantly used the field.

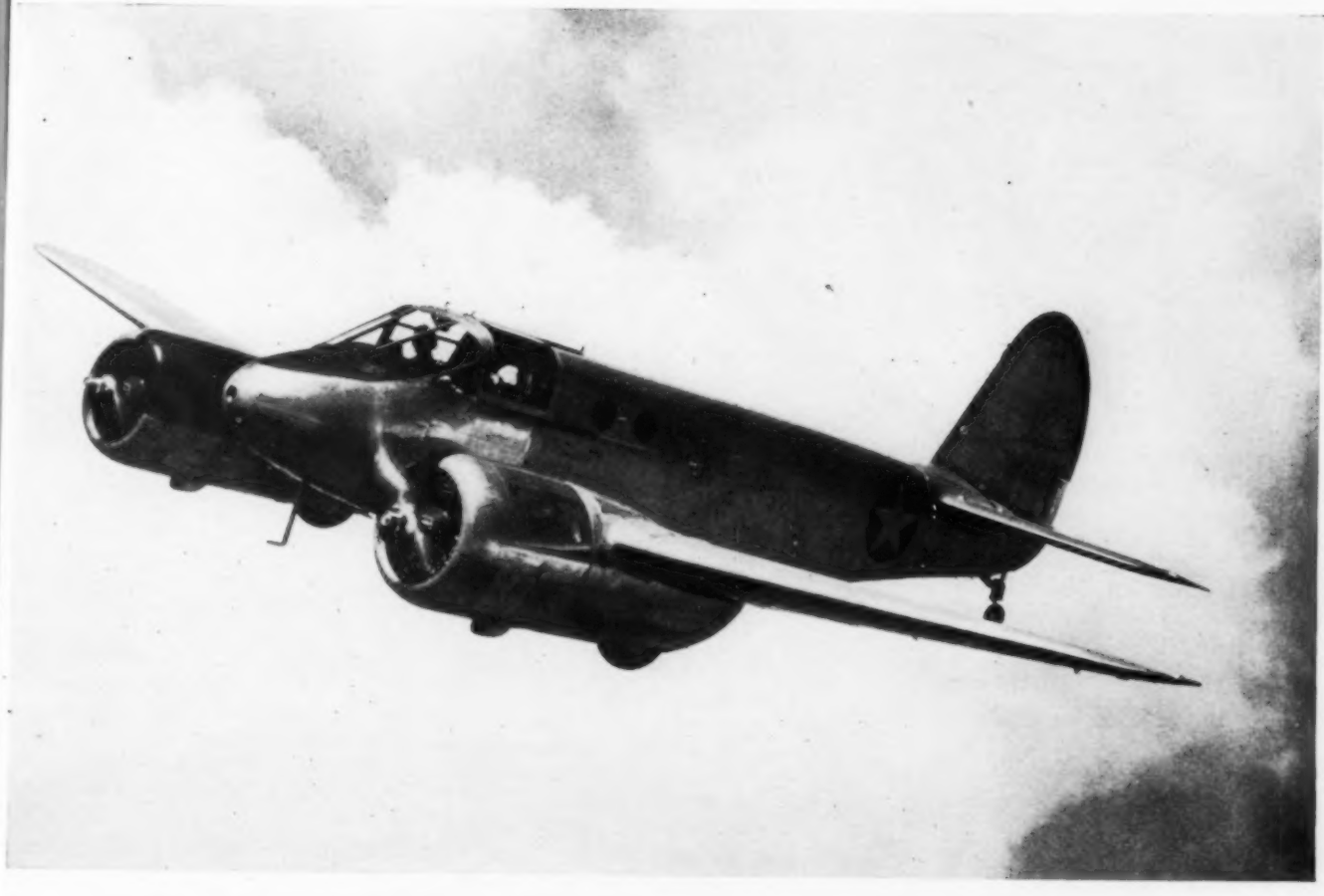
Now, on top of all that, which you would consider fairly heavy traffic, the military was accustomed to bring over a team of eight twin-engine airplanes which would make touch-and-go landings along the main runway. You would have a picture about like this: Two airplanes would be on the runway, one at each end, two would be approaching, two would be taking off, and two would be in the air making the circle around the field. By actual CAA control tower count, there was an average of 10,470 landings per week on that airport which had single runways. In spite of the fact that I flew my plane in and out of there several times a week, I never had any trouble either getting on or getting off. Ten thousand landings and take-offs in a week are a good deal more than would normally be expected from 1,000 private planes hangared on one airfield.



HELICOPTER ENGINES, designed by Franklin Aircraft and built by Aircooled Motors Corporation, are basically similar to conventional Franklin aircraft engines but look like the one shown above. The engine is a six-cylinder, horizontally opposed, air-cooled type, mounted vertically directly below the main rotor shaft. Cooling is accomplished by an engine-driven fan (top) covered by a large air housing, which conceals a clutch mechanism serving to disengage the engine from the rotor. The principal difference in the helicopter engine from the ordinary Franklin engine is in the oiling system, which has been completely redesigned.

TRAINING ANOTHER AMERICAN CADET

To Pilot Sudden Death to the Axis!



GLOBE AIRCRAFT CORPORATION

FORT WORTH, TEXAS

Manufacturers of the AT-10 Advanced Trainer and the Swift GC-1.

EMERGENCY REPAIRS *on Aircraft Radios*

For better radio performance, pilots should familiarize themselves with their equipment. Let the experts do the fixing if at all possible, but you can save time and trouble in an emergency by making adjustments yourself. Here are some practical tips.

By KARL H. STELLO

★

IN these days of war it is often impossible to obtain the services of a radio technician to work on radios in private planes. Even when you can obtain a mechanic, you will probably have to wait your turn before your radio can be repaired.

It is well for you, as a plane owner or pilot, to be able to make a quick check of the possible causes of radio failure and to make your own repairs when necessary.

The Battery

The first possible cause of a radio failure is the battery supply. If the set is operated from the storage battery, check to see whether or not the battery is fully charged. If the battery will turn over the motor, it will operate the radio. If the set is operated by dry A and B batteries, check them with a voltmeter (never an ammeter). When 45-volt B batteries drop to 36 volts, the internal resistance is so high that it makes the set noisy in operation and the batteries are considered useless. When the A batteries are low, the signal strength on the low end of the receiver dial is very weak. Flashlight batteries are considered dead when they fall from the normal voltage of 1½ volts to 1¼ volts.

Fuses

Most power supplies have a fuse which is located on the power supply chassis and usually has to be removed with a small screwdriver. This is generally the 20-ampere size and it should always be replaced with a new one of the same size. Many sets have additional fuse blocks within the set itself which should be checked before looking further for the trouble.

Some planes have master switches which must be turned on before the radio will operate. In the case of the Stinson Reliant, the master switch is merely a large fuse which must be put in place, located in the instrument board compartment.

The Vibrator

The vibrator may stick in some power supplies. This is sometimes due to the vibrator points being burned or dirty. These points can be cleaned with sandpaper, but the vibrator case must be taken off first with a pair of diagonal cutters or long-nosed pliers and the job is not worth the trouble if a new vibrator is obtainable. The vibrator filter condensers should always be checked before a new vibrator is installed, since it may be damaged if the power supply condensers are shorted, or otherwise defective.

Vibrators may be tested across a battery by placing test leads on proper terminals, found by shifting the leads around. Care must be exercised not to short out the battery. The polarity must be observed on some vibrators and if a new vibrator does not work, turn it around in the socket.

Tubes

The rectifier tube in most power supplies is the 0Z4 type tube and if impossible to obtain a replacement, a 6x5 tube may be substituted, providing the filaments are wired up (since the 0Z4 tube is a cold cathode type).

A gassy tube can be detected if it has a blue-green glow between the elements of the tube and should be replaced, but a glow near the glass envelope of the tube does not mean a bad tube.

When a tube tester is not available, and if in doubt, a new tube should be installed if it can be obtained.

The Crystal

The crystal in a transmitter should be checked by a technician since it is easy to damage or break the fragile piece of quartz that keeps the radio on frequency. If no technician is available and the trouble can be traced to the crystal, it should be taken out of the holder and inspected. The crystal should be held only by the edges between the fingers, since any oil or dirt from the hands will affect the operation of the crystal.

The crystal should be cleaned when necessary with carbon tetrachloride or soap and lukewarm water. If, after cleaning, a dark spot remains on the crystal, it has probably been fractured and will have to be replaced.

Checking the Output

It is often desirable to know whether the transmitter is sending out radio frequency energy, and the best method is to listen in to tests with a receiver that will receive on the frequency of the transmitter.

When no communications receiver is available, an indication of radio frequency can be obtained with a two-inch diameter loop of wire soldered to the two terminals of a flashlight bulb and the loop placed over the final coil of the transmitter. Such an indicator can be used to tune the transmitter, since the tuning condenser can be rotated until the bulb glows the brightest. A better indicator of radio frequency is a neon bulb held near the final tank coil or antenna output terminals of the set. If the neon bulb glows, the transmitter is putting out radio frequency energy. If the intensity of the glow varies when you speak into the microphone, modulation is taking place and the transmitter is probably operating properly. A fluorescent lighting bulb is a good indicator of radio frequency even though the filaments are burned out.

Soldering

One of the most important things in repairing an aircraft radio is to be

(Continued on page 46)

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THE FLYING FITZGERALDS

By MARIHELEN McDUFF

"Flying Fitzgeralds" is not a big-top billing for a trapeze artist troupe. The "Flying Fitzgeralds" are six brothers of Sweetwater, Texas, all top-notch pilots in military service or on special assignment with the commercial airlines.

First to fly in the Fitzgerald family was Robert, thirty-seven, the eldest, who learned while he was still in knee-pants. He did some private flying for a while, then accepted a job in the engineering department of Douglas Aircraft in California before working with the Civil Aeronautics Administration for four years. He was called to active service with the Army Air Corps in September, 1942, and assigned to the Fifth Ferrying Group at Love Field, Dallas, where he is a Captain and technical inspector.

Second "Flying Fitzgerald" is Walter, thirty-four, a Captain for Braniff Airways. He looks back on a long flying career, beginning in his teens when he and his brothers were the Fitzgerald Brothers Aviation Service of Sweetwater, and the Fitzgerald Brothers Aircraft Repair Company of Los Angeles. At one stage of the game, he flew in Central America for Cia Minera Aqua Fria. He has been flying for Braniff for five years.

Third Fitzgerald is A. B., who has flown more than a million miles for American Airlines alone. He is Chief Pilot for the Southern Division and is based in Fort Worth. Sometimes he turns up in an Air Transport Command uniform rather than in his American Airlines blues. Then you may be sure that Captain Fitzgerald and his pipe won't be around the American offices for a while—he's off on an assignment for the military. Sometimes it's India, sometimes England; but after a week or so, half the hangar at Meacham Field begins to smell like Fitz' pipe again. He started flying for American at Fort Worth in 1936, later was based in New York as assistant Chief Pilot, and then sent back to Fort Worth as Chief Pilot. His flying experience includes years of private flying and service as a pilot for the United States Navy.

The fourth brother is Glenn Fitzgerald, twenty-three, who has been flying as a co-pilot for TWA for a couple of years and who has more than 1,600 hours aloft. Glenn made his first solo flight at seventeen. He majored in engineering at Texas Technological College at Lubbock and later took a commercial refresher course at Dallas. He flew out of Houston before he went to work for TWA.

Number five is Jack, who, at twenty, is a pilot for conservative American Airlines. He is serving in the airline's military operations division for the Air Transport Command and is based somewhere in India. Jack, who has been flying ever since he can remember, followed his older brothers through Texas Tech.

Fledgling Fitzgerald is Raymond, seventeen, who has been studying for over a year at Texas Tech to be an Army flyer. He is a member of the Air Force Reserves and is going into active service * * *

GLENN JACK RAYMOND

RADIO REPAIRS

(Continued from page 44)

certain that all joints are well soldered with a hot iron. Use only rosin-core solder, since acid-core solder has a tendency to corrode.

An electric soldering iron of at least 100 watts should be used, and in an emergency a makeshift soldering iron can be made from a piece of copper tubing flattened at one end and pointed. A wood handle can be wired on and the iron heated with a can of Sterno or a gas flame. The first requisite of a good soldering job is to have a hot, clean, well tinned iron. The iron can be cleaned with a rag, sandpaper or carborundum paper after it has been heated. Hold the iron under the joint to be soldered and heat the joint itself, not just the solder.

Sometimes the joints in a set have to be resoldered with a good hot iron to make the set work properly. Use just a little soldering flux—too much is worse than none at all.

An important point on a radio is a good ground. A bond should be made to the metal structure of the plane and soldered after the grounded point has first been cleaned.

If the set does not operate after checking the battery, fuses, tubes, vibrator and crystal, it will be necessary to take it out of the plane and look for broken wires. If no broken wires are found, an ohmmeter should be used for point-to-point checking and a battery can be hooked up to the set for bench operation. A small mica condenser in series with a headphone can be used for signal tracing if no signal generator is available.

To test condensers and resistors with a meter, always disconnect one side from the circuit; otherwise you may get a false reading.

A small condenser can be placed across the suspected condenser while the power supply is on, and a bad condenser detected. If necessary to replace condensers and the exact value is not obtainable, remember that condensers add in parallel, and a condenser bank of two or more can be made up to replace the defective unit. In the case of resistors, resistors add in series and must be replaced with resistors of the same wattage.

The Antenna

Care must be taken to see that the antenna on a transmitter or receiver does not short to ground at any point. When a new trailing antenna is needed on a plane it should be about 70 feet long for 3105 K. C. A whip antenna

(Continued on page 54)

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CARGO FLYING BY JEEP

(Continued from page 29)

Costs

The cost of operation per mile held true during the year at twelve cents, while the cost per hour of operation dropped from $8.81 for the first six months to $8.38 for the thirteen months. The cost per pound for hauling the total poundage figures at thirty-one cents. The cost per pound per mile, obtained by multiplying the total miles by the total pounds, and dividing this into the total cost, is one-twentieth of one cent. To make these figures impressive they should be considered in the light of what the Post Office Department pays for air service, remembering to add what you think is necessary for overhead. So that you will have some basis on which to further your computations, assume that the airlines receive better than thirty cents a mile for hauling airmail. The All-American pick-up service in Pennsylvania, solely a pick-up service, receives fifty-four cents a mile. The government charges at the rate of ninety-six cents a pound for first class mail, dispatched by air. Air Express will run around eighty-four cents per pound.

Observations

The above story, it is realized, while quite impressive in its entirety, can be of very little value unless it falls into the hands of some individual or group of individuals who are contemplating the inauguration of feeder lines. Even then, at best, it can only prove a basis upon which to predicate figures. Our conclusions might assist in this procedure, and while we do not offer them as accurate, yet they do present and represent an avenue of thought, leading in the right direction.

It must be remembered that when we present figures as accurate they must be considered as representing so many miles, so many tons, so many hours, at so much cost. A person figuring on a definite program is enabled to add or subtract at his own inclination to what we have presented and yet arrive at a definite conclusion based on his conception of the problems. This is predicated upon an average load of 125 pounds. Now if it can be developed that a plane can haul more than our average load at our initial cost, this figure can be lowered. It is our opinion, with a review of these figures, that seventy-one miles an hour is not a fast enough rate of speed for air cargo. This should be around 120 miles an hour, but in order to get that speed and additional carrying capacity, we must consider more power, which entails greater expense, even if it were not necessary to redesign the fuselage so as to increase and better handle the cargo. It is entirely possible that a step into the radial engine field, is within the picture, if it can develop the stamina, but costs and effects must be studied to a close margin, or difficulties will arise.

We are satisfied that such conclusive facts as have been developed in Courier work by the Civil Air Patrol have never before been made public. As they have been gathered they are public property. If they assist in outlining a future rule of thumb, then aviation has been served. The Civil Air Patrol has made its contribution to an industry which, beginning with the postwar period, is generally acknowledged to be due for vast expansion.

Let us consider briefly what the aspect of the light plane is with regard to civilian flying in the immediate postwar period. Some place recently we read, with what we considered good authority, the statement that the light plane of today costs its owner in round figures $684.00 a year to maintain. This amount was for gas and oil, hangar rent, overhaul, hour checks, insurance, parts, repairs, etc. The figure is closely borne out in our records. It is about fifty dollars a month. It is too much; even twenty dollars a month is too much. It doesn't make much difference what the initial cost of the plane happens to be, if the upkeep is fifty dollars a month. It still remains an impossibility to popularize flying for pleasure. It is entirely possible for a man who can use his plane for business purposes to operate a light plane and make it pay over other means of transportation. But generally speaking, for the young fellow who comes back from the Army and wants to fly just for the pleasure of flying and because he knows how, fifty bucks is out of the picture. His plane must be as practicable as his car, his expense must be comparable, or it's out. We don't talk about the bugs in aviation any more than we talk about the bad flying conditions which we have encountered, and which at the time seemed as though they were almost beyond our capabilities. We all know, however, that the bugs are still in some of the new planes proposed, and before we can consider their practicability, except on paper, they are due for a good many hours in the air. This is not necessarily belittling aviation. We need the hot bloods that have brought us along this far, and we are satisfied that there will always be those ready and willing to sacrifice in order that their desire to fly may be consummated, whatever the cost. But we are talking about practicability, and that is something that must be developed before this myriad of planes we are told to visualize as filling the skies can become real. Now what is going to happen is that these boys who come back with the yen to fly are, at least to start with, going to rent their airplanes from the local operator on the airport who maintains a fleet. This picture looks very rosy, even without a government-sponsored training program. It will build aviation on a sound substantial footing, and in the meantime men will figure, and fly, and figure some more, until the problem is licked. So back to the "Pistol Packin' Papas" and their "Flying Jeeps"—"Hi, Ho, Silver, Come on Boy, let's go."

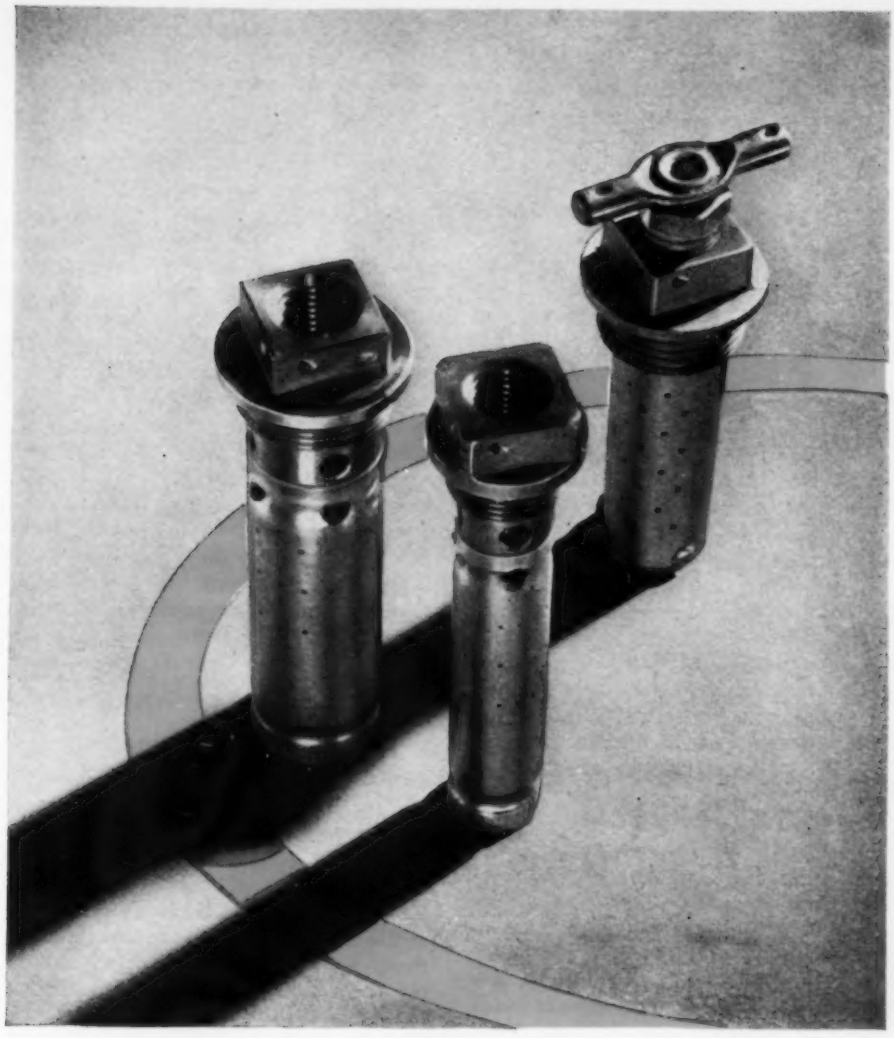
SHORTEST WAY HOME

(Continued from page 26)

fields; put enough heavy air transports into eastern Assam to bring the fuel and war supplies from India to China—do this and these Japanese lines of supply can be broken or driven so far out into the Pacific that our Navy can render them extinct.

Let's not attempt it with token or harassing raids. We are aware of the situation in the rest of this war—with its many fronts. We know that our leaders have set a course that will crush the heart of Germany first, for that very thing is happening today. But let us forget these token and morale building raids when we really begin *OUR WAR*—the war against Japan. When we begin to strike every hour of every day on Tokyo—and the white flags commence to wave—let's then begin to see them as red flags and drop the bombs every half hour if possible. We will strike at the "heart of the octopus", then the slimy tentacles which represent Japanese effort against Australia, Burma, Alaska, and China will wither and fold in toward the body of Japan proper. That is our war which we will win from Chinese bases that General Chennault had scraped from the Good Earth of China with the very finger nails of coolies. Victory is there at the end of the longest supply line in the world. It is veritably "the longest way 'round" to get there, but: In the end, when our bombers that have taken off from these Chinese bases are taking hell to Tokyo—we will be on the way to victory in the Pacific. Not only that, but the road back will be eastward to California and the U. S. A.

That's the *shortest way home.*



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AIR POWER IN ACTION

(Continued from page 33)

RAF, which dropped over 110,000 tons of bombs in that theatre during last year.

Southwest Pacific

In the war against Japan, air power last month tightened the blockade of New Britain and New Ireland Islands while taking unprecedented toll of Japanese air strength. The day-by-day log of the air war in the New Guinea-New Britain-New Ireland-Solomons area was unlike that of any other theatre, and surpassed the European zone in some respects. Sorties by fighters and bombers ran into the thousands in a few days, and U. S. units have lately intensified night operations. Jap air raids have been more frequent at night, and to counter them our night fighters are taking a growing toll.

Back in Tokyo they are now explaining away Jap plane losses in the Southwest Pacific with the word "jibaku." It means "suicidal tactics," or in other words, Jap pilots are diving into Allied bombers without regard to safety or skill. In all the Pacific in December the Japs lost 486 planes in action. This was being increased during January, for in the Southwest Pacific alone Allied headquarters counted over 400 Jap plane losses during the first twenty-five days of the month. For the same period our losses totalled seventy-seven, as compared to sixty-eight for all of December.

Our greatest attrition against Jap air strength occurred at Rabaul, New Britain, where 241 enemy planes were destroyed in fourteen strikes, most of which were Army operations. Other centers of Jap airplane destruction with scores were: Wewak, fifty-six; Kavieng (New Ireland), twenty-five; Saidor area (New Guinea), twenty-two; Arawe (New Britain), twelve; Cape St. George (New Ireland), eleven; Alexishafen (New Guinea), nine. At outlying Jap bases in the Celebes, Admiralty Islands, Netherland New Guinea and elsewhere, eighteen enemy planes were destroyed. The biggest kill in a single day occurred on January 25 when sixty-five Jap planes were destroyed, fifty-four of them at Rabaul.

Pacific

In mid-Pacific the 7th AAF and the Navy's Fleet Air Wing Two have followed up the acquisition of bases in the Gilbert Islands with almost daily air raids against the Marshall Islands. This zone has its peculiarities in that 7th AAF heavy bombers must fly what are probably the war's longest missions against the smallest targets and from the smallest bases. Raids over a round-trip distance of 2,000 miles are frequent. The Navy uses Liberators as search planes and they have penetrated the Carolines on their ever-widening forays. But there are also opportunities for short-range operations in the region of Japan's mandated island empire, for recently the 7th AAF has sent P-39's along with its 75-mm. cannon B-25's and heavy bombers. Japanese interceptions at such islands and atolls as Jaluit, Wotje, Mili, Maloelap and Kwajalein were few and far between, and what minor losses our units suffered usually came from anti-aircraft guns. Jap airdromes and supplies on the tiny coral stations are the usual target, receiving low-level 75-mm. cannon blasts and machine gun strafings as well as high explosives from heavy bombers. Ground forces were expected to seize bases in the Marshalls closer to the Jap Navy base at Truk, as the air poundings increased.

Southeast Asia

Indications of a major campaign against Burma, which would reopen the Burma Road to heavy supplies for our China operations and place Allied units at the back door to Singapore, increased after elaborate preparations in December. A Southeast Asia Command was created, and with it a strategic air force consisting of the 10th U. S. AAF in India, commanded by Brig. Gen. H. C. Davidson, and a tactical air force, consisting of the RAF's Bengal Command, led by Air Marshal Sir John Baldwin. Maj. Gen. George Stratemeyer, one of America's ablest air strategists, is deputy commander for air under Air Chief Marshal Sir Richard Peirse. This is a formidable set-up, and while British observers did not expect a major drive immediately, the Southeast Asia Command during January drove against Akyab on land, appeared ready for an amphibious assault towards Rangoon, and in the air operated several thousand sorties. The complete range of aircraft took part, from the 10th AAF's strategic bombers, which struck far behind the lines at Rangoon, Mandalay and at various airfields, railways and river communications, down to the RAF's tactical fighters, which strafed front lines and rear areas in both day and night assaults.

China

Helping maul the Japs from the air in Burma was Maj. Gen. Claire Chennault's 14th AAF in China, which was also busy along the South China Sea coast, sinking Jap supply boats bound for the fighting fronts in the Marshalls, the Southwest and South Pacific. Gen. Chennault in recent weeks had helped the Chinese defeat the Japanese invasion of China's "rice bowl" area of inner China, his fighter-bombers sinking hundreds of river sampans laden with troops and supplies and destroying hundreds other troops along the front. They scored hits on two occasions against vital Japanese targets on Formosa and knocked out Jap ships in Hongkong Harbor.

Japan

Japan's homeland again escaped Allied bombs during January, but to the north the Imperial Navy's installations at Paramushiru were three times bombed by U. S. planes operating out of the Aleutians.

While Germany remained the No. 1 objective of our war effort, Allied spokesmen on several occasions warned Japan that the U. S. is becoming increasingly prepared to press the war against Honshu before Hitler's defeat. Among those spokesmen was General Arnold.

POSTWAR PLANNING

(Continued from page 32)

nation. The majority of us sit around in our own little private offices, or down in one corner of the factory, or off on our own little insignificant airport, absolutely blind and unmindful of the overall picture and the broader panorama of aviation's tremendous strides into the coming air age. Our own little problems "get us down" and we fail to realize that practically the same problems are facing our potential postwar competitor or our country cousin down the street who might be engaged in a different phase of aviation from that of ours. We have lost the vision and perspective that the oldtimers bequeathed to us and we'll have to get these elements back if we hope to exist.

Our formula for postwar planning first requires unity, therefore, and it's up to the leaders in every end of the flying business to build that unity now, to stop fighting in isolated groups and get together on common ground for the common purpose. If we fail, the groundlings will grab the ball on the fumble and carry it through with their own set of signals — not ours. And it's getting late in the fourth quarter.

(EDITOR'S NOTE: *Subsequent articles in this series on postwar planning will cover such subjects as state and municipal aviation legislation, postwar airport requirements, global airlines, the postwar air force, civil air regulations and the economic and technical aspects of popularized flying.*)

Establishment of a Civil Air Patrol Forest Patrol was effected recently in Texas. Lt. Col. Earle L. Johnson, national commander, is shown at left above (seated) discussing plans with Texas Forest Service Director W. E. White (left) and Lt. Col. D. Harold Byrd, Texas CAP commander (right). In the group photo, Capt. L. O. Wilkerson, Bryan-College Station Squadron commander (in blouse) maps patrol areas for squadron members. —(Texas Forest Service Photos.)

CAP GUARDS TEXAS FORESTS

By JODIE LIGON

★

EXPERIMENTAL flights in forest patrol by the Civil Air Patrol from Beaumont, Texas, proved so successful in both fire protection and fire suppression that a CAP Forest Patrol has been established as a part of the Texas Forest Service at A. & M. College, College Station, Texas.

The new CAP unit has been given the Texas Forest Service's new airplane, "Smoke Chaser No. 1," a Taylor Coupe, to begin their activities, and other CAP planes and pilots and observers will take part in its operation. Flying a regular patrol over the East Texas forest area, the CAP Forest Patrol will detect, scout and report forest fires in this vastly rich lumber area. Since timber is a strategic resource—the Army and Navy used more wood in weight than steel last year—the new activity will be still another great war service of the CAP. The importance of forest patrol was pointed out in the fact that an average-size pine tree can be manufactured into enough powder to fire 7,500 rounds of 30-caliber ammunition.

The experimental patrols made last spring with Gilbert A. Mapes as pilot and S. L. Frost and W. T. Hartman of the Texas Forest Service as observers, covered 3,500 miles in about forty-two hours of flying. The air forest patrol detected a number of fires not visible to the regular lookout towers because of weather conditions. It also aided in the arrest of a number of "fire bugs" who set incendiary fires.

The establishment of the new CAP Texas Forest Patrol was the result of a meeting of W. E. White, director of the Texas Forest Service, with CAP National Commander Lt. Col. Earle L. Johnson; Lt. Col. D. Harold Byrd, Texas CAP Wing Commander; Major George E. Haddaway, former CAP base commander of an antisubmarine patrol base on the Gulf of Mexico, and Capt. L. O. Wilkerson, commander of the Bryan-College Station CAP Squadron.

Plane's Versatility Emphasized

The inaugural program featured the formal dedication of "Smoke Chaser No. 1" and a lively air show including demonstrations of various training missions which the CAP performs, including simulated bombing, dropping supplies by parachute, message pick-up and message dropping. Another feature was a "private pilot's flight test" flown by Miss Elizabeth Peck, instructor at the Cardwell Flight Academy at Bryan. Her flight maneuvers showing precision flying required of a licensed pilot were explained to the crowd. The celebration was attended by forty-nine visiting planes, an estimated 150 visiting airmen and cadets, and a crowd of about 1,800 people. Pilots and CAP planes attended from Houston, Dallas, Beaumont, Waco, Mexia and other Texas towns. These visiting CAP members were entertained with a luncheon at Sbisa Hall at A. & M. with the Aggies and members of the armed forces by the Bryan and Brazos County Chamber of Commerce.

Capt. Wilkerson, in telling of the new CAP service, said, "The Texas Civil Air Patrol is glad to undertake another wartime mission. Timber is a critical material for the war effort, and we hope to be able to maintain a 'protective umbrella' over East Texas forests to prevent and suppress forest fires. Air reconnaissance offers splendid observation to aid the ground crews of the Texas Forest Service. We can readily spot fires, direct ground crews with our two-way radios and when it comes to that, we can read car license numbers."

In addition to gathering evidence on intentionally-set fires, checking fire damage, timber reconnaissance and other air patrol work over the East Texas forest for the Texas Forest Service, the CAP Texas Forest Patrol will also contract for patrol work for lumber companies or others at prescribed CAP rates.

Assisting in the training program is Lt. Larry J. Fisher, who was director of training at a coastal patrol base and has over 300 hours of antisubmarine patrol from that base. Other CAP antisub veterans engaged in the new forest patrol are Capt. Wilkerson, and Lt. J. B. Clark, of Wichita Falls, Texas, both of whom served with coastal patrol.

With the first operational bases set up at Bryan and Lufkin, it is planned to add other units as rapidly as pilots and observers can be given specialized training in forest fire detection and suppression. At the present time and until a larger operating budget is secured, volunteer pilot time and planes are being requested. ★ ★ ★

What KIND OF AIRPLANE WILL YOU FLY *Tomorrow?*

By FRED E. WEICK

FRED WEICK
Chief Engineer, The Engineering and Research Corp., producers of the Ercoupe.

The first personal airplanes to be produced after the war will be those having the CAA-approved designs. It is almost certain, considering the pressure of war work on both the manufacturers and the CAA, that the approved designs after the war will be those that were already approved as of December 7, 1941. Of course minor refinements, which would not influence performance, flying and handling characteristics or structural strength, can be made, but there probably will not be time for making basic changes requiring approval of stress analyses and flight tests. The few basic improvements made since Pearl Harbor in some light planes modified for war will be advantageous, but even they will not represent the most desirable personal plane that could be designed at the time the war ends. The government can aid substantially in the conversion from war to peacetime production by issuing priorities for material needed for jigs and fixtures and general production for the first couple of months or so of peace.

I believe the most widely used personal airplane for some time to come, will be the two-place plane—because of cost. There is a definite swing toward higher engine power, even for two-place airplanes, but I believe the two-place plane with sixty or seventy horsepower will remain most popular because that is about the minimum power that will give generally acceptable performance for two people. The four-place single-engined plane should also be popular, and there appears to be a considerable trend toward 4- or 5-place twin-engined personal transports.

Increased speed obtained by making personal airplanes aerodynamically cleaner will be obtained without increase in cost of operation. There is a relatively large field for improvement in drag reduction, both in respect to improvement in form and the use of retractable landing gear. Cleaner designs will very likely make use of flaps to help take-off as well as landing, and possibly spoilers to help steepen the flight path for landing.

There appears to be a general trend toward designing airplanes to be free from the loss of control associated with stalling and spinning. Airplanes having good lateral control at even the lowest speeds and highest angles of attack that can be maintained in flight, and which are "characteristically incapable of spinning," have now been tried in service for a period of years and these features appear to be coming into general acceptance. The tricycle landing gear, with its simplification of landing and taxiing maneuvers and its avoidance of ground-looping and nosing-over difficulties, also appears in general favor, and with its use on military and transport planes may now be considered out of the unconventional stage. Further simplification of control can be accomplished with tricycle landing gear, making two-control operation practical, and the rudder pedals can therefore be eliminated. This has also been tested over a period of years, and appears to be gaining favor in future designs of personal airplanes. One reason for this, no doubt, is the fact that the CAA has made substantial reductions in both dual training time to solo and total flight time before private pilot's certificate can be obtained for airplanes "characteristically incapable of spinning" and equipped with tricycle landing gear and two-control operation.

It is axiomatic that airplanes will be more widely used if they can be built to be more useful. One way to do this would be to make the airplane capable of completing an entire journey from the starting point, which is usually not at an airport. I believe this can be done by making the airplane roadable, with folding wings that stay with it, and I believe that such airplanes will be given sufficient trial to prove their worth. Such a roadable airplane can be made into a good flying machine, but probably only a fair road vehicle, and it would have to be accepted as such.

RADIO REPAIRS

(Continued from page 46)

is generally best for a receiver on the beacon frequencies.

An emergency windsock can be made from the round bottom of a tin can if a piece of metal about six inches long is soldered to the center of this round piece of tin.

Care must be taken to see that the headphones are matched to an aircraft radio receiver. A manufacturer's instruction sheet should be consulted for the correct impedance match, since a variety of headphones are made and the receiver will perform much more satisfactorily with the correct headphones.

Headphones or microphones should never be dropped, since these contain balanced buttons of carbon granules and these carbon granules may pack when dropped, which considerably decreases the sensitivity and may ruin the instrument.

In some small aircraft receivers the screws in the intermediate frequency transformers may become loose due to vibration. This will cause intermittent reception and can be remedied by merely tightening up the screws, but care must be taken not to move the screw adjustment of the padder condensor on the I.F. transformer while doing this.

Before taking a set out of the plane to make repairs, it is well to label all wires which are disconnected such as antenna, ground, etc. Ground wires are generally black and B plus wires are generally red.

If you are unable to find the trouble within a short time, it is well to leave the job for a radio technician, since he will be better able to locate the trouble more easily and repair it more quickly if nothing has been changed or disturbed. No technician likes to work on a radio that several people have tried to repair and perhaps changed the hookup in so doing. If you have made any changes or noticed anything unusual, by all means tell the mechanic, since it will save you time and money. ★ ★ ★

Pronouncing "Helicopter"

We had a meeting down in Washington of all those working on the helicopter. We decided the word was pronounced "hellikopter" so we all agreed to call it that. Then everyone in the group made speeches and called it "heelikopter." All except Igor—when he gets excited he calls it "hellikopeter."—*William B. Stout, "daddy" of the Sky Car, referring to Igor Sikorsky, "daddy" of the helicopter.*

CONFUSION *on the Potomac*

Part III—Conclusion

THIS is the third portion of certain confusing testimony presented recently during a House sub-committee hearing in Washington. In reading this testimony keep in mind that this kind of hearing is the rule rather than the exception in most Washington considerations dealing with aeronautical subjects, because we do not as yet have a clear-cut National Air Policy and because so many overlapping bureaus and agencies have their fingers in the aeronautical pie. Remember, too, how such statements that appear in this and similar hearings can do untold injury to the industry and confuse even the most airwise congressmen, who, for the most part, are sincere men, working towards the welfare of the nation and for the welfare of aviation as well. They are, however, victims of their own error in failing to provide the legislative ground-work that would once and for all eliminate the multiplicity of Federal agencies, combining them into a strong, centralized Department of Aviation staffed by competent, experienced and technical men. We submit this information in the genuine hope it will so impress the airmen of the nation they will intensify their efforts through their duly elected representatives in Congress to provide the necessary legal vehicle that alone can give us truth, progress and world supremacy in the air, without which we shall continue to stumble along the same old rocky road of chaos and confusion without a common compass course.

Aircraft Production Board Explained

Mr. Elston: Do you agree with the witnesses who testified previously that cost-plus contracts contribute to hoarding of labor and contribute to labor shortages?

Mr. Wright: I think I would agree with that. I am not favorably inclined towards cost-plus contracts.

Mr. Elston: How many members compose your Board?

Mr. Wright: There are eight members composing the Board, which include the Commanding General of the Army Air Forces, the Chief of Materiel Maintenance and Transport of the Army Air Forces, the Assistant Chief, Bureau of Aeronautics, the Head of the Plane Section of the Bureau of Aeronautics, the Head of the British Air Mission, and the Senior Air Officer from the British Air Staff located in Washington, and myself, representing the Aircraft Production Board, and my assistant, who is also on the Aircraft Production Board.

Mr. Elston: What have the British got to do with the allocation of contracts in the United States?

Mr. Wright: The Joint Aircraft Committee started in August or September of 1940 was dealing at that time very decidedly in the allocation of planes between various countries and the United States Army Air Forces and the Navy, which was then being built up, inasmuch as at that time we were not in the war, and as you know the French and British contributed very substantially to building up the industry sufficiently in this country so that there was anything to start with when we did want to get planes, and at the same time the Army Air Forces wanted to build up their forces as rapidly as possible, and it was necessary to adjudicate what allocations could be made to England, France and so forth.

Mr. Elston: The British are not contributing anything now, are they?

Mr. Wright: Contributing anything towards what?

Mr. Elston: They are buying airplanes directly in this country, are they?

Mr. Wright: No, sir, I think all their contracts are out now.

Mr. Elston: All lend-lease?

Mr. Wright: That is right.

Mr. Elston: Yet they have two men on this Board.

Mr. Wright: That is right.

Mr. Harness: Mr. Wright, I do not infer any criticism by this next question of you or the committee or anything, but I cannot understand for the life of me why this Joint Committee who works so closely with the Air Corps of the Army and Navy does not co-operate a little bit better in trying to keep down the cost of producing those things—I don't know whether you should have granted this application or not, I have not anything to say about that, but don't you take into consideration the performance of airplanes and the cost?

Mr. Wright: Not this committee.

Mr. Harness: In considering these items for the government?

Mr. Wright: No, sir.

Mr. Harness: Don't you think there should be some better co-operation on trying to effect economies in the expenditure of the people's money?

Mr. Wright: Well, I would like to say there that I was really dealing with production matters, and not with matters of cost. That is done by the procuring agencies of the military service and they go into costs very, very carefully, and that is a definite consideration with them, whatever they buy or do not buy, the same as the technical excellence of the product, and the military services first have to determine what plane they want, with due consideration to cost and technical excellence and performance and everything else, and present them to our committee. We accept that as gospel because our terms of reference give no jurisdiction over cost.

Mr. Harness: You sit there as a technical committee to pass on these various strategic items going into the production of airplanes, and allocate the number of planes that can be built, and also what time they should be built; don't you have some idea of the cost of producing those planes?

Mr. Wright: Yes, we have some idea.

Mr. Harness: Don't you ever bring in any recommendation to the Air Corps about the procurement of those items?

Mr. Wright: Yes, in quite a few cases.

Mr. Harness: For instance, when a concern comes here not asking for money to build up their business, but merely asking for the right to build planes, and it is presented to you, a technical airplane builder, that the plane is a good one, that it will function equally as well as those we are buying, isn't there anybody there that is interested in the government to the extent of trying to save some money?

Mr. Wright: At the time this case was presented the cost consideration was not part of the thing at all. Mr. Johnson's letter did not say it is cheaper than anything else; it did not say he had tested it before any government agency, which I don't think he had at that time, but he may have.

Mr. Harness: I assume you had before you blueprints and so forth.

Mr. Wright: No, there was nothing in the world but his letter.

Mr. Harness: You had no other information than the letter he wrote?

Mr. Wright: No, the committee had nothing else.

Mr. Harness: Then you did not know at the time you made this decision whether this was a good airplane or not?

Mr. Wright: No, that is right. We were not judging the merits of the airplane, we were judging whether it was wise to permit manufacture for the production of a type that is a counterpart of one that is already being produced in large quantities and was being curtailed because requirement had gone down.

Mr. Harness: Do you think if you had this information before you that this plane was equal with those they were buying and could be built at about one-third of the cost of the others, that might have had something to do with the decision?

Mr. Wright: Not at the time, sir, that data would have been presented to the Procurement Services with the suggestion they study the plane and the cost situation, if they had a requirement for that type of plane.

Review of Civil Air Patrol Needs

Mr. Harness: Well, they might not have had a requirement, they still had a requirement for trainers, didn't they—primary and advance trainers?

Mr. Wright: Yes, that is right, but it is a reducing requirement now. It does not simplify the program to cancel one satisfactory trainer and bring in a new facility to build the same thing that may or may not be better.

Mr. Harness: How about the Civil Air Patrol? Is that considered a necessary service or function in the war effort?

Mr. Wright: It depends to whom you address the question, sir. The military services—and I am inclined to differ with them on this. I think it has served a useful purpose—but the military services have in general not been favorably impressed with that one work.

It seems to me the facts are on the other side of the argument. As I say, I personally think they should have been encouraged more, but that was not their view.

Mr. Harness: They are having difficulty—I mean the personnel of the Civil Air Patrol are having difficulty obtaining planes now, aren't they?

Mr. Wright: Yes, sir.

Mr. Harness: To carry on their function?

Mr. Wright: That is right. I understand that there is a request being made to the Joint Aircraft Committee for a program for Civil Aircraft Patrol to be placed before us. Now we haven't received it yet.

Mr. Harness: I say, if it should come before you, you could reconsider the application of this concern, could you not?

Mr. Wright: If the Civil Air Patrol authorities technically desired this plane as against others that are in production, then the committee would become a contracting agency and undertake the technical responsibility of definitely deciding whether Mr. Johnson's planes were better than the ones that were in production, and if they decided they were, then they could be put in.

Mr. Harness: If the authorities, whoever were handling that program, were to pass favorably on his plane, it would be up to your committee to say whether or not he could get the materials to manufacture?

Mr. Wright: Yes, sir.

The Chairman: Mr. Johnson would have to have a blueprint of the complete airplane himself, or he would never be able to produce one in order to have the agency test it, is that correct?

Mr. Wright: Yes, sir.

The Chairman: All there was then in the present program is to create the very definite impression on the part of this man that the government contracts at this time are closed and none of the other concerns outside can go into the field in any way, shape or form.

Mr. Wright: No, sir, the committee has on several occasions, to take care of the point you are intimating, approved experimental contracts for one or two planes when the manufacturer wanted to build them for that purpose.

That was not this case. This case was presented complete with a letter and on a modified basis, presumably for an exisiting type. It was not an experimental thing. Mr. Johnson has never submitted to us a request for building his twin-engined plane, which is in blueprint form, so far as we are aware. It has never come to our committee. If it did, we would undoubtedly approve that just because we want to have as much development going ahead as possible. That is not the case he submitted.

The Chairman: Speaking of military training programs, is not the Navy at the present time carrying out a very largely expanded program for pilots?

Mr. Wright: No, their program is constant at the moment, so far as planes are concerned.

The Chairman: It is my understanding they have been carrying on quite an extensive program, and, due to the large number of serious crackups, particularly out in Nevada there, which would indicate possibly their need for airplanes might be quite excessive.

Mr. Wright: I can only say their program does not reflect any increase. They may have had planes built up in excess of their requirements, they may have had a bank of planes, I don't know, at the present time, how the program of the Navy is, how it stands.

The Chairman: I have heard there have been a large number of accidents out in Nevada, a location there which might be due to the type of plane they were using, it might not be satisfactory.

Mr. Wright: Might be.

The Chairman: Do you have any further statement that you might want to make?

Mr. Wright: No, sir.

The Chairman: Thank you very much.

Testimony of Jack Nelson

Mr. Burton: During the time you were with the War Production Board did you have any occasion to pass upon anything in connection with the Johnson Aircrafts, Inc.?

Mr. Nelson: Yes, sir.

Mr. Burton: Please state to the best of your recollection what occurred.

Mr. Nelson: Mr. Johnson came to the office on an application for raw materials which was all we were charged with dishing out. I told him at the time we could only give raw materials to manufacturers who were certificated to us as essential to the war effort by a federal agency. He did not have that certification. I checked with the Civil Air Patrol who told me that their need was greater at the time for parts to keep their existing aircraft going than for new planes. They had a substantial portion of their airplanes grounded at the time because they could not get parts due to the fact of not being able to produce planes to achieve the aerial superiority that they were so urgently seeking at the time in the theatres of war.

I went to the State Department who told me it would not help the relationship of the United States government with Mexico to deliver those planes that were proposed to be sold to the Mexican government at the time. The Joint Aircraft Committee said that neither the Army nor the Navy wanted the airplanes.

In view of the fact that we had not been given enough materials for civil aviation, at least, the amount they had asked for, to keep their existing planes going, and without the endorsement of the federal agency, I told him that the materials were not available.

Mr. Burton: Can you state whether there existed in your department any antagonism towards new designs or new developments of airplanes?

Mr. Nelson: No, sir, not that I know of, because we all wanted to keep alive civil aviation in the aviation industry.

The Chairman: So that it has been the feeling in your Board that new types, new developments of the aircraft industry should be carried on at all times?

Mr. Nelson: Anything in the world that can preserve a semblance of civil aviation for the duration of the war is our one and only goal, and mine, sir.

The Chairman: That has been the attitude, has it, right along?

Mr. Nelson: It was the attitude of the Aircraft Priorities Branch so long as I was with it. I cannot speak for Mr. Donald Nelson and the rest of the Nelsons that are over there.

The Chairman: Any relatives?

Mr. Nelson: None whatsoever.

Shortage of Engines Cited

The Chairman: And your main reason for turning down this particular request at the time was you thought the materials were not available?

Mr. Nelson: Well, I know they were not, that is unless some people who are very much higher in the game than I made some awful serious mistakes, because we took from existing agencies, which roughly can be outlined as commercial airlines, the 165 planes that were left to them, they needed the material to keep the replacements. And next, our training services, which are training approximately 22,000 pilots a month for the Army and Navy, and they, as you know, have a call in on every civilian type of airplane they can get their hands on, and we will keep on making planes as long as we can get new engines and new parts.

The third are the thousand and some odd Civil Air Patrol planes which are sponsored by the National Headquarters of Civil Air Patrol. Those planes that we carried as essential were the ones where the owners had pledged their aircraft, but there were many, many Civil Air Patrol members who used priorities from the Civil Air Patrol, sent in their airplanes for a couple of months' or a couple of weeks' operation and took them out. They used them just as decoys to procure priorities, and would not pledge their ships to serve the war effort.

We knew at that time that the Navy or the Army, I don't know which, was going to take over the Coastal Submarine Patrol, because with the big ships that were then not available — as soon as they were available, not only could they spot submarines, but they could destroy them, which the Civil Air Patrol could not, but with the big planes they could do that, and with the light ones they could not.

The next category of types that were certificated to us as essential were in Alaska, because, as you know, a tremendous burden was placed upon the transportation facilities in Alaska. You probably have had called to your attention the critical transportation situation there.

Another class of planes which were certificated to us as essential by the Department of Agriculture, and that is crop dusters and the planes used for patroling out on the ranches. The manpower shortage has curtailed the cowboys so they are using the planes, putting tommy-guns in them and they go out on the range. There is a lot of rustling by Ford and Chevrolet trucks and they just go down there and shoot at them.

Another need for airplanes is in the Forestry Patrol Service, where aircrafts—where they spot fires from the air, and drop by parachute the fire fighters and catch the fire as it starts, because the manpower, they don't have enough manpower.

Then too, we have to use many planes because of the curtailment in the shipping, vessels to haul needed supplies down to the Aleutian Islands.

They do not come in as this essential aircraft, and we in the government agency, including the State Department, BEW, which is now OEW, we handle only materials under priorities—

The Chairman: In this particular plane, what materials were critical?

Mr. Nelson: The principal things were engines, sir, and we wanted engines, the Civil Air Patrol were crying for engines to replace those in the existing aircraft.

The Chairman: They were the same type of engine?

Mr. Nelson: They were the same manufacturers, I mean, the manufacturers which built this type were building the type we wanted, at least, I know at the time the Civil Air Patrol were crying for barrels and other parts of engines at the Lycoming factory, and the Lycoming factory were not filling the needs of maintenance to keep existing aircraft in the air.

The Chairman: The other materials generally in the plane were not critical, were they?

Mr. Nelson: Everything was critical. We had a list of CMP materials we were not allowed 100 per cent of their requests, our requests, to keep existing planes going. Only, if we got a new plane, we had to go and ask for additionals, and there was no need of asking for additionals, when we could not get the parts at the factory to keep something that existed going. Sir, that was the basis of our determination.

Mr. Burton: Thank you very much, Mr. Mr. Nelson.

Mr. Nelson: May I go now, sir?

Mr. Burton: Yes, sir.

Pin-up picture for the man who "can't afford" to buy an extra War Bond!

YOU'VE heard people say: "I can't afford to buy an extra War Bond." Perhaps you've said it yourself . . . without realizing what a ridiculous thing it is to say to men who are dying.

Yet it *is* ridiculous, when you think about it. Because today, with national income at an all-time record high . . . with people making more money than ever before . . . with less and less of things to spend money for . . . practically every one of us has extra dollars in his pocket.

The very *least* that *you* can do is to buy an *extra* $100 War Bond . . . above and beyond the Bonds you are now buying or had planned to buy.

In fact, if you take stock of your resources, and check your expenditures, you will probably find that you can buy an *extra* $200 . . . or $300 . . . or even $500 worth of War Bonds.

Sounds like more than you "can afford?" Well, young soldiers can't afford to die, either . . . yet they do it when called upon. So is it too much to ask of us that we invest more of our money in War Bonds . . . the best investment in the world today? Is that too much to ask?

Let's all BACK THE ATTACK!

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Combat Planes Replacing Trainers on Production Lines in Mid-America

Conversion from trainer planes to combat models on the industry's production lines gained momentum last month, with official forecasts emphasizing the increased need of heavy bombers and lessened demand for trainers. Particularly noticeable has been the utilization of Mid-American and Southern trainer factories for combat production. In Kansas trainer plants are figuring more prominently in heavy bomber work, and the super-bomber outlook steadily improves as Boeing and Consolidated Vultee plants gird to step up the output of new heavy weights. The Bell plant in Georgia is expected soon to enter full production on the B-29. In Texas the flow of B-24's from North American's Dallas Division has increased considerably, and trainer lines there have been shortened again to accommodate increased P-51 fighter production. P-38 deliveries will expand greatly as a result of conversions at Consolidated Vultee's Nashville and Miami divisions.

The Army has not released details which would fully illustrate the trend from trainers to combat models, but the Office of War Information, discussing production cut-backs, has listed "non-combat" aircraft among many items on which production will be eased during the coming months. "More than offsetting this will be an almost doubled production of combat aircraft, with greatly increased emphasis on bombers," OWI added. It said the Navy had effected during the last six months a $226,000,000 cut-back in trainers, transport aircraft, lighter-than-air craft, gliders, outmoded patrol bombers and scout observation planes.

Douglas Deliveries Totalled Billion Dollars in 1943; 85 Per Cent Increase Slated

Douglas Aircraft Company delivered 96,446,000 pounds of combat planes, valued at one billion dollars, to the nation's armed forces in 1943, a 204 per cent increase over 1942 output. In weight, the company produced 16 per cent of the national plane output. Man-hours per plane unit were reduced more than 50 per cent, with Fortress man-hours reduced 71 per cent at the company's Long Beach plant. Per-unit costs to the military were lowered an overall 22 per cent. Backlog of war orders calls for an 86.4 per cent increase beyond 1943 record figures. Percentage of women employees of Douglas has dropped from 53 per cent in September to a current 46 per cent.

More Fact Than Fancy Seen in Possibilities of Utilizing Jet Propulsion Principle

The Army Air Forces' new propellerless fighter plane, built by Bell Aircraft Company and powered by twin jet engines produced by the General Electric Company in collaboration with England's Royal Air Force, may have appeared too far on the Buck Rogers side when announced last month, but in the light of research it loses much of its fantasy and appears to possess more logic than meets the casual eye.

Harland M. Poyer (above), Niagara division chief engineer of Bell Aircraft Corp., designed America's first jet plane — in 1941. Bell is going into production on twin-engined jet fighters.

For centuries scientists and aeronauts have labored to perfect jet propulsion. There are a few jet amateurs in the United States. Frank Whittle, an RAF researcher who conceived the GE jet engines, obtained his first patents in England in 1930. In 1941 the Italians flew the Campini jet-propelled airplane from Milan to Rome, and illustrations have been published describing its features.

How It Works

From all this background, it is learned that the jet engine is composed of amazingly few major parts. A compressor (1) draws in air and squeezes it into a relatively large combustion chamber (2), into which fuel is directly injected. Under great expansion, the combustion gases are released through an exhaust nozzle (3) at high velocity and still burning. These gases expand rearward at such speed as to force the airplane forward with strong thrust.

For taking off, the exhaust nozzle is opened wide and looses a blast of flame, gases and smoke. The craft becomes air borne with apparent ease and a blastful swis-s-sh. As speed is increased in flight, the exhaust nozzle is constricted, much in the manner of a garden hose being made to spray, and jet velocity is increased, with the flaming tail narrowing down to an acetylene-torch-like wisp. The plane's approach is silent, and overhead it is heard to emit a muffled, thinnish roar, with the exhaust flame being visible at night.

AAF pilots who have flown it since Bell Test Pilot Robert Stanley first took it aloft in October of 1942, say the twin-jet fighter handles almost like a normal fighter as far as flying is concerned. It is unique in that vibration is almost eliminated entirely, and because the exhaust is behind the cockpit it is more silent than usual. Pilot fatigue is greatly lessened. Efficiency increases with altitude, as does speed, since the jet has less drag to overcome in thin atmosphere. "Faster than the best we have now" is the AAF's description of the Bell fighter's speed range.

Lightplane Jets Expected

Supercharging, the bogey of combat flying with internal combustion engines, is not needed in jet engines. The fuel can be kerosene or low-grade gasoline and therefore much safer than 100 octane spirits. Cooling is eliminated as a problem, along with the thousands of moving parts the jet engine eliminates (heat in the combustion chamber can be isolated from the wing or fuselage mounting).

Although the Army is after speed in its jet plane, those who have followed jet developments expect experiments will be made soon in small, light planes, which they believe can be converted without excessive alterations. Because jet engines are simple and small, they can be manufactured at low cost (heat-resistant metals are the big catch). Maintenance will be slashed to a minimum by their simplicity. They will burn the cheapest fuels.

Incidentally, jet enthusiasts don't apply the measurement of horsepower to jet engines. They gauge them by thrust pounds. A Cub, for example, would require a jet engine of about 350 PT's (pounds of thrust). The AAF's fighters will have jets generating several thousand PT's.

EASTERN AIRCRAFT Production Council plans for 1944 are discussed above by retiring President Larry Bell (left), C. M. Vandenburg (center), general manager, and New President L. C. Goad, who is vice president of General Motors in charge of its Eastern aircraft division.

Eastern Plants to Build 43,000 Planes in Fifteen Months, Council Told

Member companies of the Aircraft War Production Council, East Coast, Inc., are building $8,000,000 worth of warplanes every day, Lawrence D. Bell, retiring president of the Council, reported in relinquishing his post to L. C. Goad, vice president of General Motors and general manager of the Eastern Aircraft Division. The 1943 combined production of the group was 24,566 planes delivered to the armed forces, while airframe weight in planes and spare parts totalled in excess of 180,000,000 pounds, an increase of 105 per cent in units and approximately 184 per cent in airframe weight over 1942.

While the average daily production in 1943 was $6,000,000, the companies reached the $8,000,000 daily figure in the closing weeks of the year, turning out approximately $2,225,000,000 in planes and spare parts during 1943. This figure does not include production of engines, propellers or other parts manufactured by certain Council member companies. Goad, in accepting the presidency of the Council for the next four months, pointed out that General H. H. Arnold's recent statement that 145,000 planes are scheduled for completion in the next fifteen months means that member companies must step up production to produce 30 per cent of this number, 43,000 airplanes, weighing about 120,000 tons, during the next fifteen months. While the companies built 77,500,000 pounds of airplanes and spares in the past four months, approximately 13,000,000 pounds more than the entire year of 1942, Goad said production during the coming fifteen months must equal that of the past two years.

Heavy Production Honors Won by Consolidated Vultee

National aircraft production figures for 1943, compiled by the War Production Board, revealed that Consolidated Vultee Aircraft Corporation delivered more airplanes by number and weight than any other manufacturer. Consolidated Vultee delivered more than 126,000,000 pounds including spares compared with 115,000,000 pounds delivered by the second largest producer and 73,000,00 pounds by the third largest manufacturer. Consolidated Vultee in 1943 delivered over 12 per cent by number and over 16 per cent by weight of all aircraft built in the United States, Tom M. Girdler, chairman of the board, stated. The difference between number and weight percentage figures is due to the fact that the company produces more heavy four-engine bombers than any other industry.

P-47 Tops Fighter Output

More P-47 Thunderbolts were produced in December than any other fighter-type aircraft, according to figures of the War Production Board, Alfred Marchev, president of Republic Aviation Corporation, announced. The Farmingdale division of Republic Aviation exceeded the quota set by the Army Air Forces for production of P-47's in 1943.

McDonnell Doubles Aircraft Output and Facilities

McDonnell Aircraft Corporation doubled their production during 1943, shipping approximately 1,737,000 pounds of airframe compared to 847,000 pounds in 1942, while backlog of orders for 1944 exceeds $50,000,000, an 80 per cent increase over last year. Personnel expanded during the year from less than 2,000 to over 5,000, with plastic personnel jumped from six to almost 200 persons. Over 97,000 pounds of MAC's "Structmold" plastic aircraft gun turret parts and ammunition boxes were shipped in 1943. Floor area of the company increased by over 216,000 square feet, a 41 per cent increase, including MAC's new Memphis facilities, four buildings acquired in St. Louis and Washington offices opened in the spring. In accident frequency rate terms of the National Safety Council, which compares number of lost-time accidents to number of hours worked, MAC's rate was five against eleven and four-tenths for the industry.

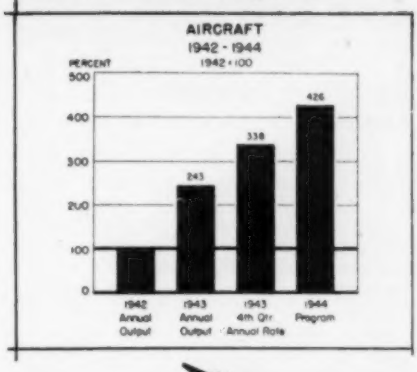
Beech Claims Absenteeism Record

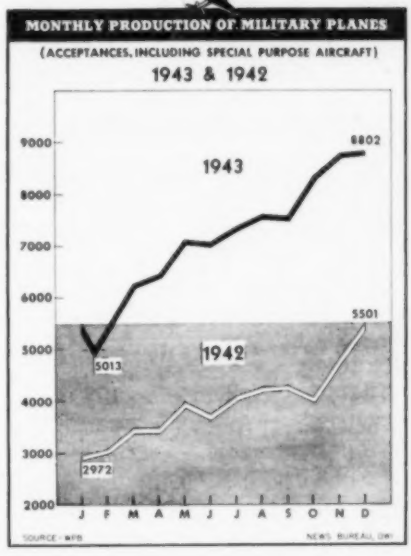
Beech Aircraft Corporation's overall absenteeism, including sickness, was half the average for the aircraft industry in 1943 according to government reports compiled from some sixty major airplane producers. Walter H. Beech, president, said he believed Beechcrafters led the entire industry, with not more than one out of every 4,000 workers AWOL on any average working day during the year. In terms of the ten-hour workday, time lost at Beech from AWOL absenteeism in 1943 amounted to less than a minute. An increase of 227 per cent in number of Beechcrafts delivered to the armed services during 1943 was attained over 1942 production rates as of September 30. Beech has a present backlog of orders exceeding $250,000,000, requiring capacity operation for the next two years.

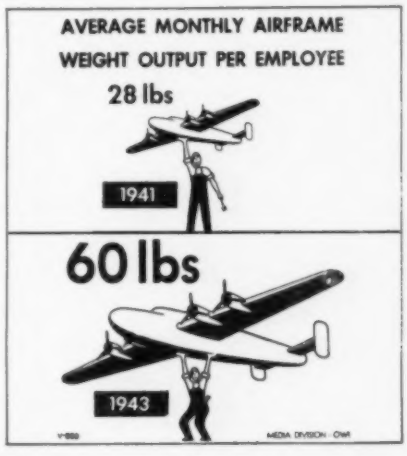
Lockheed Short Cuts Save Four Million Man-Hours

Of 27,000 employe suggestions submitted since October, 1942, by Lockheed Aircraft Corporation workers, 5,500 were accepted and installed and resulted in production short cuts that will save four million man-hours annually—enough to build an extra 400 P-38's. Workers submitting the ideas received $270,000 in cash awards. A person whose short-cut idea is accepted receives 10 per cent of the first year's saving effected by his suggestion, up to a maximum of $500. Highest winner was an inner-wing assembly worker whose nine proposals netted $2,079.

Charts Show Progress







"Idea" Program Pays Off

A total of 11,766 employe suggestions during 1943 at Consolidated Vultee Aircraft Corporation's Fort Worth division resulted in a saving of 743,580 man-hours and brought awards totalling $27,000 to workers, while cost improvement ideas from supervisory personnel resulted in saving 2,813,911 man-hours. Douglas Aircraft Company's employes contributed 40,164 ideas during 1943, of which 8,000 award-winning ideas saved over a million man-hours and were credited with economies equal to production of hundreds of bombers and transports. Cash awards ranging from $19.50 to $650 were given to 1,460 ideas in top classifications. Women workers contributed about 25 per cent of the year's ideas.

AIRLINES . . .

Southern Airways Seeks Fifteen Routes

Southern Airways, Inc., has applied to the Civil Aeronautics Board for fifteen routes linking eighty-eight cities and towns in eight southern states, Frank W. Hulse, president, announced. The airline system, embracing passenger, mail and property service, could be put into effect immediately, Hulse stated, and would use multi-engined aircraft. The routes proposed by Southern, who are now engaged in training Army pilots in Alabama, Georgia and South Carolina, would provide air service between Florida, Georgia, North and South Carolina, Tennessee, Alabama, Mississippi and Louisiana.

Air Express Increasing

Air express in combined air-rail shipments in November totalled 36,189 in number as against 27,939 handled during November, 1942, an increase of 29.5 per cent, according to Railway Express. For the period January-November, 1943, the increase was 28 per cent over 1942.

Randolph to Seek Air Pick-up Extension

Representative Jennings Randolph recently stated that he probably will seek an amendment to the Lea-Bailey bill to revise the Civil Aeronautics Act, to provide rapid extension of airmail pick-up routes. Randolph led the movement five years ago for the passage of legislation for airmail pick-up under which service now covering 116 cities and towns in six eastern states was first started as an experiment by the Post Office Department.

All-Cargo Caribbean Service Added

The first all-cargo Clipper service in the Caribbean area was inaugurated recently by Pan American World Airways System on a round trip from Miami to Puerto Rico. The Clipper, stripped of 2,500 pounds of passenger accommodations, partitions and sound-proofing, took off with 8,800 pounds of emergency and commercial express shipments. Operating on no fixed schedules, the plane will make flights to and from Barranquilla, Colombia, as well as Puerto Rico. The first night flying over lighted airway in the Caribbean area was also inaugurated recently by Pan American between Miami and San Juan, allowing the 2,300-mile round trip to be completed in one day.

New Braniff Publicity Man

Walter M. Henshel has been appointed director of publicity and information for Braniff Airways in Dallas. Henschel was formerly connected with Interstate Circuit, Inc., Texas theatre operators, as publicity director.

SMU Adds Air Transport

E. H. Pickering, recently a consultant on air cargo with the Army Air Forces headquarters in Washington, and currently with the Guiberson Corporation in Dallas, began in February conducting an accredited course in air transportation at Southern Methodist University in Dallas, Texas. He is a former vice president of Texas Air Freight, Inc.

Systematic Planning of Airports Urged at Midwest Conference Held in Kansas City

America's air future was the theme of the Midwest Airport Planning Conference, held in Kansas City, Mo., January 24-25, and attended by 635 representatives from fourteen states, including educational directors, airline officials, aircraft manufacturers, airport managers, city and chamber of commerce officials and airport experts and technicians.

Jennings Randolph, U. S. Representative from West Virginia and principal speaker at the conference banquet, stressed the seriousness of the fuel problem in the future, and suggested synthetic fuel plants be developed. E. Lee Talman, executive vice president of Transcontinental and Western Air, Inc., stated aviation planning should be a national project as well as state and community plan. T. E. Flaherty, supervisor of airports for the Civil Aeronautics Administration, Fifth District, said airport systems and aviation must grow together and airport planning for the future must be systematic, with estimates made on the amount of air travel, type of equipment to be used and frequency of schedules and operations. L. R. Inwood, executive assistant of TWA, stated that safety heads the list of airport planning requirements. John M. Hagan, Aeronca Aircraft Corp., and Airport Project Chairman of the Personal Aircraft Committee of the Aeronautical Chamber of Commerce, predicted that private flying will eventually be a mode of transportation that will remake our civilization.

Col. Roscoe Turner, president, National Aviation Trade Association and of Roscoe Turner Aeronautical Corp., discussed the important job of fixed-base operators in educating the public to the wide field of operations and usefulness of aviation. Turner also discussed equipment and service necessary for fixed-base operators. Smaller cities of 1,500 to 15,000 population should develop their own airports as an aid to selling the air age nationally, according to Donald E. Pratt, Manager of Hays, Kansas, Airport. In discussing municipal financing of airport construction and maintenance, Alfred McDonald, director of parks and airports of Wichita, Kansas, said plans must be fair to the public. John Groves, secretary, Committee on Airport Development Program, Air Transport Association of America, and former manager of the Washington National Airport, stressed the importance of airports paying their own way, describing from his experience the various income-producing sources of airport activities.

Dr. John Monteith, Jr., principal agronomist, U. S. Army Engineers, Washington, emphasized the advantages and uses of turf on airports and the value of small aircraft development in this regard. Dr. Frank W. Hart, educational consultant, Civil Aeronautics Administration, University of California, explained the growing importance of aviation education. Closing sessions of the conference were devoted to individual consultation with airport experts and technicians concerning airport uses, operation, management, financing, sites, standards, requirement, design, paving, lighting, hangars, equipment and weather bureau facilities.

Braniff Adds 2,600-Mile Mexican Airways System

A 2,643-mile airline system in Mexico, granted by the Mexican government recently to T. E. Braniff, president, is expected to be added soon to the 3,108-mile system of United States air routes operated by Braniff Airways, according to Charles E. Beard, Braniff vice president. The Mexican system, second in size to the Pan American Airways set-up there, is to fly the Mexican flag, be domiciled in Mexico, staffed and operated by Mexican personnel and will serve Nuevo Laredo, Victoria, Matamoros, Tampico, Puebla, Vera Cruz, Merdia, Tapachula, Salina Cruz, Cuautla and Cuernavaca, all of which cities it will link with Mexico City. Service has been promised as soon as Douglas DC-3 planes and other equipment become available.

New Customs House for Mexican Air Traffic Opened at Fort Worth

A new $25,000 international building has been opened at Meacham Field, Ft. Worth, Texas, by American Airlines to accommodate passengers and express moving through the Ft. Worth port of entry between the United States and Mexico. A Spanish-speaking staff of fourteen airline employes assists passengers, and the building also houses U. S. customs, immigration, Department of Agriculture, Office of Censorship and public health officials, as well as American International Air Express offices. Two spacious waiting rooms are provided. Air traffic to and from Monterrey and Mexico City has greatly increased. Two daily schedules are operated through Ft. Worth by American Airlines.

1,000-Pound Boost in Airliner Weights Sought

Airline operations of Douglas DC-3 and Lockheed Lodestar transports at take-off weights 1,000 pounds in excess of those currently allowed will be sought at a Civil Aeronautics Board hearing on February 8. Proposals in each case specify aircraft equipped with Wright G-202 or Pratt & Whitney S1C3G engines, and in the case of the DC-3, the increase in landing weight sought is 800 pounds, while the 1,000-pound take-off increase for the Lodestar would be accompanied by the same increase in landing weight. Maximum landing and take-off weights now permitted under civil air regulations for DC-3 commercial transports are 24,400 and 25,200 pounds. Military operations have already utilized much higher loadings for similar model airplanes.

Lee Sworn In

Josh Lee, former Oklahoma congressman who has filled the Civil Aeronautics Board position vacated on February 1, 1943, by the resignation of George P. Baker, last month was sworn in for a full six-year term as a CAB member.

Engine Run Between Overhauls Is Doubled

Pratt & Whitney Aircraft engines in combat are being operated up to 975 hours between major overhauls, more than double the military rating of 420 hours between major overhauls for these engines prior to the war, according to William O. Gwinn, acting manager of Pratt & Whitney Division of United Aircraft Corporation. The engines operating up to 975 hours (270,000 miles) are 1200-horsepower Twin Wasps, while 2000-horsepower Double Wasps are flying 900 hours before being torn down for overhaul. Twin Wasps are being used a maximum of 850 hours between major overhauls in commercial airline operation compared to 650 hours formerly permitted these engines by the CAA in 1941. Pan American Airways System in Mexico, Cia Mexicana de Aviacion, regularly fly Twin Wasps 1,000 hours between major overhauls.

Laister-Kauffmann Acquires Bowlus Sailplanes, Inc.

Laister-Kauffmann Aircraft Corporation of St. Louis has acquired Bowlus Sailplanes Company, Inc., of Los Angeles through an exchange of stock. The Laister-Kauffmann Company, which produces two-place training gliders for the Army Air Forces are now in production on a thirty-place cargo carrying glider, will add to their glider designs the Bowlus single-place, eight-place and fifteen-place gliders, as well as a new large transport glider now being developed at their St. Louis plant. The merged companies will combine a group of the most successful glider manufacturers and top aviation authorities. The Laister-Kauffmann Company is headed by John W. Laister, president and John R. Kauffmann, secretary-treasurer. The board of directors of the Bowlus Company includes: Donald W. Douglas, Albert C. Essig, Reuben Fleet, Carl Squier, Tom Wolfe, Dwight Whiting, and Colonel Edward S. Evans; stockholders include: Jack Frye, Robert Gross, Ronald Beuler, and John Northrop. Dwight Whiting will serve as Pacific Coast Representative of the merged companies.

More Paving for Ft. Worth

Authorization of 835,000 square feet of additional concrete paving, costing $320,000, has increased the paved area at Consolidated Vultee's Fort Worth bomber plant to a total of more than 8,000,000 square feet—equivalent to 200 acres and enough to pave a four-lane highway about thirty-five miles.

Miami Building P-38 Units

Empennages for Lockheed P-38's assembled at Nashville are being made at the Miami Division of Consolidated Vultee Aircraft Corporation, according to Plant Manager Norton C. Sather. The tooling men from Miami have spent two weeks at Burbank studying requirements for the Florida plant to fit P-38 production into that being done for Corsair, Vengeance, Liberator and Sea Wolf torpedo bomber assemblies, which Miami will continue to build.

News of Aircraft Parts Manufacturers

By SARA HOLLENBACH

Bendix Aviation, Ltd., of North Hollywood, has become Pacific Division of Bendix Aviation Corporation, and products of the Pacific Division will be known as Altair products. Palmer Nichols, new vice president of Bendix Aviation Corporation, stated that operations and personnel will remain the same.

Thirty-three editors of employe publications have formed a subgroup within the Aircraft Parts Manufacturers Association to discuss mutual aims and problems of aircraft parts companies and for journalistic improvement of their publications. Edwin M. Benedict, Century Metalcraft Corporation, and Ted Burke, AiResearch Manufacturing Company, both of Los Angeles, were elected executive committee assistants to Sara Hollenbach, Association office staff, secretary-chairman.

Willys Boosts Aircraft Output

Production of the chest-and-wing section for the Navy's Corsair fighter plane, involving assembly of 25,000 different parts, has been tripled during the past three months by the aircraft division of Willys-Overland Motors. The increased output was credited largely to the development of a half-mile station-to-station assembly line which permits rapid training of inexperienced aircraft workers. In exceeding Navy production quotas, the Willys aircraft plant turned out twice as many wing sections in October as in September, and increased production another 50 per cent in November, Canaday stated.

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PERSONALS

Fenwick Wolf Foote Buckwalter

HUGH M. FENWICK, former assistant to the executive vice president of Consolidated Vultee Aircraft Corporation, has joined Curtiss-Wright Corporation. A veteran pilot, Fenwick recently returned to the United States after five months abroad, where he flew 32,000 miles and toured air bases in England, North Africa, Burma and India. Fenwick, for eleven years European representative and engineering test pilot for the Aviation Corporation in Turkey, was elected vice president of Vultee Aircraft, Inc., in 1940, and received his position with Consolidated when the two companies were merged.

DONALD S. WOLF, former assistant service manager, has been promoted to service manager of Ranger Aircraft Engines Division of Fairchild Engine and Airplane Corporation. Wolf, a private pilot, joined Ranger in 1937 as a draftsman.

WILLIAM A. FOOTE has been appointed sales co-ordinator of Littelfuse Incorporated, El Monte, California, and Chicago. Previously, Foote has served as president and general salesmanager of Wingfoote Petroleum Company, marketing counsel for Standard Oil Company of New York and national director of sales for Deoxolin Chemical Corporation.

JOHN C. BUCKWALTER has been promoted from assistant plant manager to plant manager of Douglas Aircraft's Chicago division. Buckwater was project engineer on Douglas's airline prototype, the DC-4, and helped design the B-19. He also assisted in development of the C-54, transport cargo plane, and was executive engineer prior to his assignment to the Chicago plant.

HOWARD S. WELCH, formerly vice president and general manager of Bendix Aviation Export Corporation, has been appointed export sales manager for the Sperry Gyroscope Company. Previously, Welch served as manager of export sales for Studebaker Corporation, and became president of the Studebaker-Pierce Arrow Corporation when Pierce Arrow was acquired by Studebaker. . . . OSCAR W. NELSON, manager of the propeller division of Curtiss-Wright Corporation's Beaver, Pa., plant, has been named manager of division planning for propeller production with headquarters at Caldwell, N. J. AUSTIN J. BROOKS, formerly plant manager of a large propeller concern, has been named to succeed Nelson at the Beaver plant. . . . K. E. SUTTON, associated with Wright Aeronautical Corporation since 1929 as assistant factory manager, production manager and general superintendent of its Paterson, N. J., area, has been named manager of the new Wright Wood-Ridge, N. J., plant. A. M. SCHEERER, Wright experimental engineer, has been appointed engineering manager of the new Wood-Ridge plant. Scheerer formerly was superintendent of Wright's experimental laboratory and recently assistant experimental engineer. . . . JOHN S. GARRAWAY has been appointed salesmanager, hydraulics division of Adel Precision Products Corp., Burbank. Garraway, associated with Adel since 1941, formerly operated a hydraulics parts manufacturing company. . . . F. L. HOLSER, formerly plant manager of the Wilshire Division of Interstate Aircraft and Engineering Corporation of Los Angeles and El Segundo, Calif., has been promoted to vice president of the company. . . . KENNETH L. VORE, formerly assistant traffic manager of Consolidated Vultee Aircraft Corporation, has been appointed assistant to the traffic manager of the Aeronautical Chamber of Commerce of America.

DEAN C. SMITH, veteran pilot, explorer and aviation sales director, has joined the executive staff of Fairchild Engine and Airplane Corporation in charge of development activities. Smith previously was director of transport for the airplane division of Curtiss-Wright Corporation. . . . MAJOR CHARLES C. BASSETT, JR., who has served overseas in the air arm during both World Wars, has been named assistant to the general manager of Fairchild Aircraft plant in Burlington, N. C. . . . WING COMMANDER J. G. GOODENOUGH has been appointed head of a new diesel and engine equipment division of Adel Precision Products Corp. Goodenough, formerly in charge of power plant development for the Royal Canadian Air Force, specializing in research on winterization problems, will have as his first assignment at Adel fuel and injection problems connected with hydraulic control equipment. . . . RAYMOND J. KIRBY, formerly chief engineer and manager of research and development of the Tokheim Oil Tank and Pump Co., Ft. Wayne, Ind., has been named special research and development engineer on hydraulic and pumping equipment of Adel Precision Products Corp.

Perelle Heads Ft. Worth Plant

George J. Newman, manager of Consolidated Vultee Aircraft Corporation's Fort Worth division, has left on an important foreign assignment for the corporation. Newman's special assignment, the nature of which was not revealed, will take several months. During his absence, C. W. Perelle of San Diego, Consair vice president in charge of manufacturing, will locate his headquarters at Fort Worth and direct the division's operations in addition to his other duties.

Morgan Heads Personal Aircraft Activities

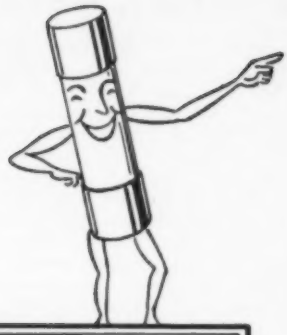
MORGAN

Activities of the Personal Aircraft Department of the Aeronautical Chamber of Commerce under John E. P. Morgan, manager, began in earnest on January 1, with headquarters in Room 204 at 715 15th Street, N. W., Washington, D. C. The Chamber's Personal Aircraft Committee, of which Joseph T. Geuting, Jr., vice president of General Aircraft Corp., is chairman, guides the department. Morgan distinguished himself in the development of the use by the Army of light planes for artillery spotting, liaison and courier operations and has been serving as Washington representative of Piper, Taylorcraft and Aeronca Corporations.

Institute of Aero Sciences Names Officers, Recipients of Achievement Awards

The Institute of the Aeronautical Sciences recently announced election of officers for 1944 and presentation of awards for aeronautical achievements. The new officers are: President, Major R. H. Fleet; Vice Presidents, Wellwood E. Beall, vice president in charge of engineering, Boeing Aircraft Company; William K. Ebel, vice president in charge of engineering and chief engineer, The Glenn L. Martin Company; Elmer A. Sperry, Jr., vice president, Sperry Products, Inc.; G. M. Williams, vice president, Curtiss-Wright Corporation; Executive Vice President, Bennett H. Horchler; Treasurer, Charles H. Colvin, director of the Daniel Guggenheim School of Aeronautics of New York University; Secretary, Robert R. Dexter; and Lester D. Gardner, chairman of the Council and president of the Aeronautical Archives.

The Institute's selections for six awards for aeronautical advancement in 1943 were as follows: Brigadier General Eugene G. Reinartz, commandant, School of Aviation Medicine, Randolph Field, was selected for the John Jeffries Award for his work on the neuropsychiatric aspects of aviation medicine; William Benjamin Bergen, chief flight test engineer, Glenn L. Martin Company, was chosen to receive the Lawrence Sperry Award for his work in the theoretical and experimental studies of dynamic loads on airplanes; Colonel Hollingsworth F. Gregory, project officer on helicopters, was selected for the Thurman H. Bane Award, given for the first time this year, for his contribution to the military and commercial development and use of the helicopter; Dr. Sanford A. Moss, General Electric engineer, was chosen for the Sylvanus Albert Reed Award for development of the turbosupercharger which has made possible the high altitude operation of aircraft; Lieutenant Colonel Joseph J. George, chief of Special Studies Section, Weather Division, Headquarters, Army Air Forces, was chosen for the Robert M. Losey Award for outstanding contributions to the science of meteorology as applied to aeronautics, and William H. McAvoy, chief test pilot, National Advisory Committee for Aeronautics, was selected for the Octave Chanute Award for continuous service in the flight testing of experimental airplanes under hazardous conditions imposed in aeronautical research.



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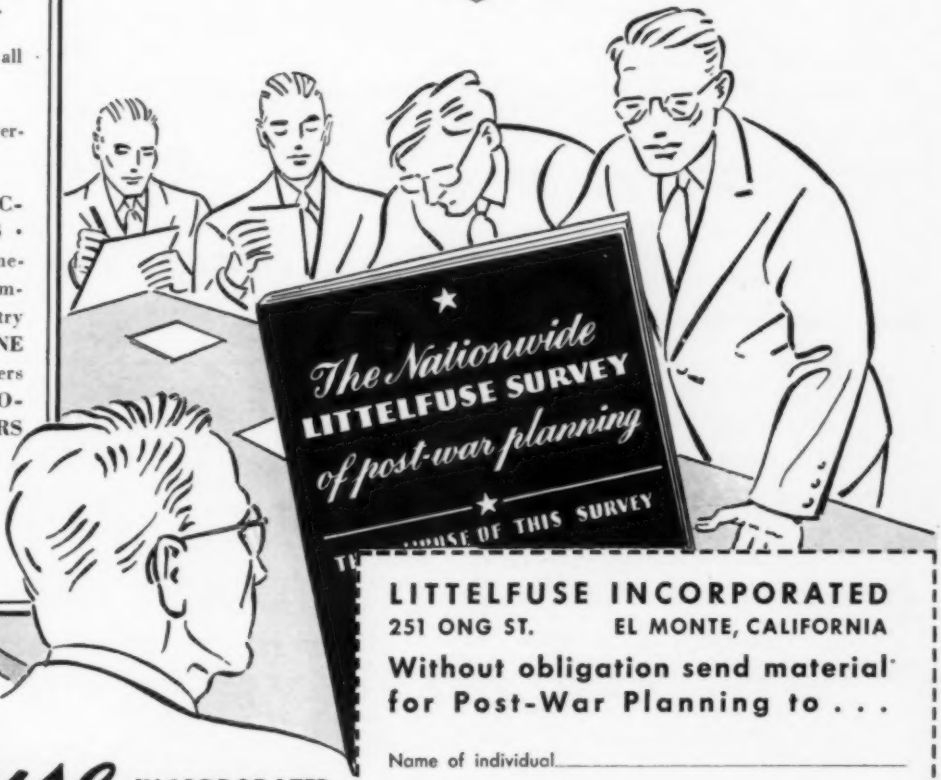

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A new engine shipping case made of light, inexpensive wood and which will save millions of feet of lumber each month has been designed by Pratt & Whitney engineers to replace the heavy wood, non-collapsible case formerly used. The new case can be knocked down and returned to the engine plant for several usages, whereas the old case had to be scrapped after one use. In the new design, the weight of the engine is supported by a plywood cone fastened to the bottom of the box. The engine is bolted to the cone, eliminating the steel supports formerly required to suspend the engine from the sides. The plywood cone has no seams as its veneer is laid out in a continuous strip and wound about a heated core. Thoroughly tested, the new case will be put into use at all Pratt & Whitney plants and those of its licensees as soon as sufficient cones are produced.

Super-Duper Hot Food Network Feeds Lockheed

An elaborate $500,000 commissary network which will distribute 60,000 hot meals daily to nearly 100,000 employes in nine Lockheed Aircraft Corporation factories in the Los Angeles area has been opened in Burbank. Forty per cent of the meals are served in a massive central cafeteria and the remainder are rushed by fast trucks to twenty-two canteens in eight other Lockheed plants over a twenty-mile radius. The project was built by Lockheed and presented to the Lockheed Employes' Recreation Club which operates it. Profits, if any, will be used in welfare and recreational work.

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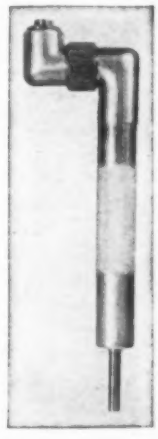

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NEW PRODUCTS

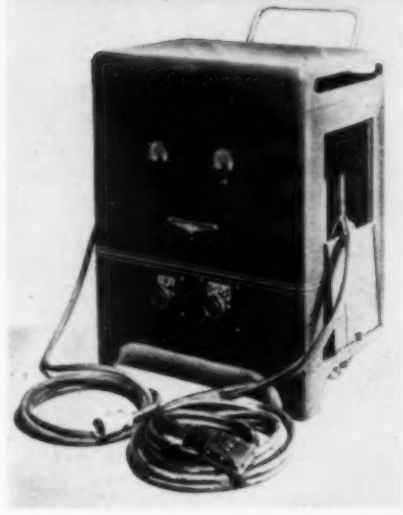
A New Plotter and Protractor

A new plotter and protractor called Astro-Nav has been introduced by Jardur Import Co., of New York. The new protractor was designed by Hugh Thomasson for plotting celestial lines of position. By eliminating dividers, parallel rules and triangles, it is considered faster, more accurate and simplified. The device is made of Vinylite, said not to shrink, non-burning, durable and heavy. It is 5¾ inches in diameter, can be easily read and is protected against rubbing or blurring. Slots are frosted on beveled edges for pencil reference which can be removed instantly with the fingers.

New Fire Detector, Rectifier for Turrets

Fenwal, Inc., of Ashland, Mass., announces a new continuous type and unit type fire detector for use throughout aircraft; primarily, engine and accessory sections. The detector, shown at right (top), is in the form of a fusible alloy tube, copper-plated, containing inorganic insulating beads which support a conductor-wire. This, when mounted on an engine or throughout a plane, gives instantaneous warning to the pilot for manual operation of fire extinguishing equipment.

Flame applied to the assembly causes the tin alloy to melt, filling the spaces between adjacent beads thereby completing the circuit between the conductor-wire and the grounded tube. The completed circuit is then used to actuate either signal light or other alarms. It is said a false alarm will not occur from an ordinary backfire. The new detector has been tested and checked by various aircraft manufacturers and government agencies.



A new rectifier (shown at right, bottom picture) manufactured by the Airplane Manufacturing and Supply Corp., Hollywood, Calif., is said to be heavy enough to operate modern, heavy-duty aircraft gun turrets. Known as the AMSCO Rectifier, the element has a "no-load" voltage considered safe to any of the electronic devices or electrical equipment on the plane. It can provide power for the ground crew in servicing and testing any size aircraft. The rectifier is of the "self-healing" dry-disc magnesium-copper-sulphide type needing no bulbs or tubes. Thermal protection is provided by a small fan motor giving air circulation in the cabinet insuring against overload or overheating. Units may be obtained with a capacity of twenty to twenty-eight volts at 200 amps, with a DC output starting inrush of 1200 amps; a three-minute rating of 400 amps and continuous rating of 200.

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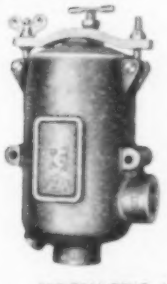

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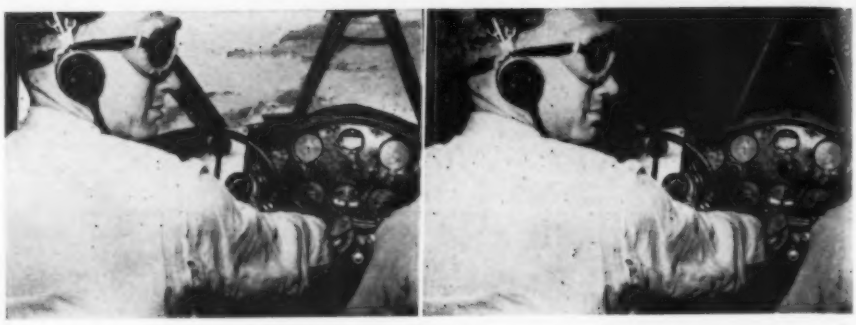

INSTRUCTOR SEES THIS . . . STUDENT SEES THIS!

The "Polaroid" system of instrument flight instruction, which has been in use at several southern training establishments for many months, is growing in popularity. The system consists of transparent green plastic sheets covering the windows of the plane and a transparent red plastic lens which the student wears in his Polaroid goggle. This combination makes the green windows appear to be completely opaque to the student, blocking out all vision outside the plane. The instructor or check pilot wears no goggles and enjoys complete external vision through the transparent green windows. The materials were developed by the Polaroid Corporation of Cambridge, Mass.

Army Cancels CAA-WTS Flight Instructor Courses

In mid-January the CAA War Training Service announced it was discontinuing all training in the secondary, cross country, Link instrument and flight instructor courses. The Army Air Forces had advised CAA that it "is no longer necessary to continue to train flight instructors through civilian agencies." About 26,000 men had been taken into the Air Corps Enlisted Reserve for such training. Only 4,176 were still in CAA training on December 30, 1943. The CAA-WTS is continuing to provide a flight indoctrination course for the AAF in conjunction with the college training program. The instructor course abandonment affected fifty-nine flight contractors and fifty-four colleges and other educational institutions. The contractors employed 963 flight instructors and over 1,000 mechanics, and ground schools in the program employed over 350 instructors.

Anti-Stall Devices for Private Flyers Perfected

James George, Civil Aeronautics Administration engineer, announced on January 26 that two low-cost and reliable stall-warning instruments will be commercially available in the near future and will "eliminate the No. 1 hazard of private flying." A third type, which will warn airline pilots of impending stalls even when wings are iced up, is under development.

The CAA in 1941 was requested by NACA and later by industry representatives to develop a successful stall-warning device. Attempts had been made since 1918. At an Institute of Aeronautical Sciences meeting last month the CAA revealed it had succeeded in perfecting two devices for private flyers which may be easily installed in existing aircraft, are light in weight and self-monitoring. The two devices warn the pilot of an approaching stall by sounding a horn and flashing a light. One device, being produced by the W. and L. E. Gurley Company of Troy, N. Y., actuates the signals when the airplane reaches a certain angle and the air flow is reversed, forcing a vane which projects from the leading edge of the wing to move upward, thereby closing a switch. The other device, developed at Wayne University of Detroit and produced by Power Equipment Company of Detroit, is operated when pressure reversal sucks a diaphram upward and forces an attached metal plate against electrical contacts. It has a cut-out button which can be pushed during take-offs and landings to eliminate horn noise when radio reception from a control tower is desired.

The air carrier device, being conducted by the Westinghouse Electric & Manufacturing Co., for the CAA, is based on a warning being triggered by changes in the characteristics of the airflow over the top surface of the wing.

Hawthorne Gets Capital Charter Service Rights

Hawthorne recently acquired the operating rights from Air Services, Inc., for a charter and sight-seeing service from Washington National Airport after the war. Beverly E. Howard, Hawthorne president, purchased the majority of stock of Air Services from John Wynne and Mrs. William Payne, widow of the organizer of the company, which is the only carrier allowed by the Civil Aeronautics Board to operate this type of service from the Washington Airport.

Cadets Using B-25's and Skip Transition

B-25 Mitchell bombers, modified for training purposes, are now being used for aviation cadet training, Lt. General Barton K. Yount, commanding the Army Air Forces Training Command at Fort Worth, Texas, disclosed last month. For over two months, aviation cadets at La Junta, Colo., advanced twin-engine school, have received all their advanced flying training on the medium bombers.

The B-25's at La Junta have had some of their combat equipment removed and have been redesigned as AT-24's. Formerly, student pilots did not use modern combat type bombers until transition training, a nine-week period following graduation as commissioned officers from an advanced pilot school. The first class of cadets to train exclusively in AT-24's graduated in December and the majority went directly to operational training units, skipping transitional training entirely. In addition to the La Junta cadets, part of the current classes at Brooks Field, San Antonio, Texas, and Turner Field, Albany, Georgia, both advanced twin-engine schools, are receiving advanced training in AT-24's, and a course for AT-24 instructors is in operation at the Central Instructor's School, Randolph Field, Texas, General Yount added.

Third Inter-American Aviation Program Opens

Examinations will be given in February to applicants from the other American republics for the third Inter-American Aviation Training Program. According to the Civil Aeronautics Administration, which conducts the program under sponsorship of the State Department, three types of aeronautical scholarships are offered by the United States. They provide fifty-two courses in aviation mechanics, pilot training and aeronautical technician training, with tuition at civilian schools, room and board and a $30-a-month expense allowance, together with transportation from the candidates' home to the U. S. training schools and their return. Full details and application forms are obtainable from U. S. embassies.

Argentina Uses Lycoming

According to the Lycoming Division of the Aviation Corporation, a new Argentine trainer, the IMPA-Tu.-S.A. No. 0, is powered by a 65-hp. Lycoming. It is a neat-appearing low-wing, with side-by-side arrangement and fixed landing gear, and has an empty weight of 960 pounds and useful load of 474.6 pounds. Wingspan is thirty-six feet, length twenty-four and four-tenths feet and height seven and four-tenths feet. Maximum speed is 103 mph., cruising 90.6 mph, and the craft has a six-hour cruising range.

New Chief of Navy Primary

HARDISON

Rear Admiral Osborne B. Hardison, cited for valor as commander of the carrier Enterprise in the Battle of Santa Cruz, was to assume duties in February as chief of Naval Air Primary Training with headquarters at Kansas City, Kansas, succeeding Captain Dixie Kiefer, chief of staff of the Naval Air Primary Training Command who has been serving as chief of training on additional basis. Admiral Hardison graduated from the Naval Academy in 1916 and received flight training at Pensacola in 1922-23.

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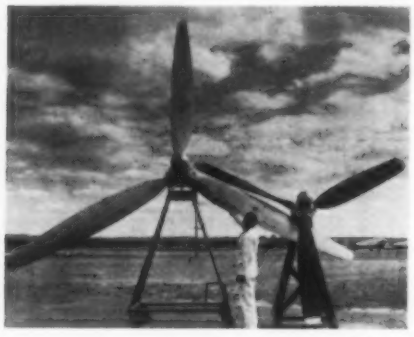
GIANT PROPELLERS ON WARPLANES

Hamilton Standard Propellers recently constructed a twenty-foot-diameter propeller, the largest in the world, for test purposes at their East Hartford, Conn., plant. The prop, which is not scheduled for any specific plane, dwarfs the "large props" of the Flying Fortress or Douglas DC-3, which are eleven and one-half feet in diameter. The Hamilton Standard propellers on the Army's huge B-29 Super Fortress measure seventeen feet in diameter. They are manufactured under license from Hamilton Standard by Frigidaire, Curtiss-Wright's propeller plant at Indianapolis, Ind., is now building propellers fifteen feet, two inches, in diameter for use on Navy PBM-3 Mariner patrol bombers. Curtiss's huge propellers are of the full-feathering type, built around the principle of electric control at the hub. The blades are of hollow steel.

Patrol Bomber Husky



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By TONY HAGMANN

Dallas, Texas . . . Several pairs of openers were discovered in D City this past month when the hands were dealt and checked. We learned that Weldon Williams had picked a very fair little peach blossom, Marjorie Rouse, to be Mrs. W. From now on we'll deal him out. Second hand brought to light a local war over airports. City vs. private ownership. So far we don't know who won the pot, but the City bought a site called Lake June. We pass.

Terminal News . . . Ed Gates (CAA) transferred . . . Doug Hayward, moved to White Rock . . . Wilber Rychley of Pratt and Whitney to West Coast, Phelps Lane to Dallas . . . Braniff expanded offices . . . also Delta . . . American next. And Margaret Keogh has gone for a two-week, "civilian leave" . . . which is a wartime vacation whether Army, Navy or Civilian. Got a letter from Lt. Johnny Van Dyke who has soloed his BT-13 ("Vultee Vibrator") and loves her. Only needed four dual hours. Johnny saw a hospital from the inside from a deal in the Pacific, and was recently 'lowed to come home for flight training.

From the New Orleans office of Sperry Gyroscope came Roger Landry, E. F. Reedy, Mac Naughton and J. C. Plehm to meet and greet Capt. R. F. Stemen. "The Captain is a fighter Doc where you couldn't get a doctor," said Curry Sanders of Lockheed. Sperry gave a party which was aces high. . . .

Things we didn't know until now . . . Major Ajax Baumler is now stationed in the States. He has a row of ribbons which mean action and we do mean the "deuces wild" variety. He came through Dallas and looked all over for his Flying Tiger partner, China "Red" Probst! Red is in the Fifth Ferry Command a fixin' to be recommissioned in the Army. He figures it's time to ante again. We did not know that Capt. Claude Gossett used to fly the Good Neighbor Run. . . . yes, South American way.

Out at Mustang there are some Army Grasshopper planes which the CAP uses to recruit future pilots, according to Herbie Nash. "This is a wing," etc. Very cunnin'.

Working her way through air school is Louise Yott. She "deals them off the arm" at the airport with a smile which means, "I've got twenty hours . . . and need soooomany more."

Everybody seems to hold good hands and the game will continue. Folks, deal yourselves in.

From Marion Melcher, Kansas City, Mo. . . . About the Terminal, you will notice a change for space has been provided for the new Kansas City-Denver route being taken over by Continental Air Lines, Inc., beginning with January, 1944. Furthermore, if plans for our airport go through, the levee is to be pushed back, permitting the extension of the present north-south runway to 7,000 feet, and there is talk of additional fire protection as well as a modern face for the Muny Airport! To top that, City Manager Cookingham has requested local flyers to join city officials and the Chamber of Commerce in getting together a postwar-needs plan for landing fields. With "Cookie" started, you flyers will have some additional landing spots, for that man gets things done!

The Kansas City Unit of the Women's National Aeronautical Association has welcomed back an old member, Mrs. Cathryn Bush Aber, First Vice President of the national organization, who resigned as president of the Los Angeles Unit when her husband returned to the Heart of America as Assistant Traffic Manager for Mid-Continent. And did you know among its members the Unit includes the only woman who is a photographer in an airline. Her name is Georgia Bryan,—and she can click a mean photo! The airline? Progressive TWA.

Helicopter Taxi Service—please note. We used to say that it's out where the geese go barefooted, but since our big engine plant is out there, the Public Service Company has extended street car service to the southern extremity of Kansas City.

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CAP Membership Near 100,000; Units Active in Airport Operation

While the Civil Air Patrol's Army Air Forces Cadet Recruitment Program has developed "spectacularly", the senior CAP organization is expanding constantly and now has Wing commands in each of the forty-eight states and local units in over 1,000 communities. Membership in CAP and CAP Cadets now is close to 100,000, according to Lt. Col. Earle L. Johnson, national commander.

Many CAP pilots and planes, including those formerly on Coastal Patrol, are being placed in new operations, especially on tracking missions for the armed forces. Many units have taken over operation of airports and in some instances are developing new airports. While wartime conditions may delay actual construction, CAP units are locating sites and readying plans.

—(Photos by Memphis Squadron, Group 2.)

Recent activities by the Civil Air Patrol at Memphis are shown in these pictures. At top left, First Lt. Fred J. Bottom, Memphis Squadron Commander, is shown inspecting CAP cadets at Memphis headquarters. First Sgt. Scott Julian, CAPC Squadron Commander, is directly behind Lt. Bottom. Top right, a Memphis pilot swoops low to make message pick-up at recent Union City, Tenn., maneuvers. At the bottom left, reading left to right, Capt. W. C. Whelen, personnel officer, and Capt. John K. Maddin, executive officer of Tennessee Wing headquarters, who delivered an Army Liaison plane, are shown officially turning it over to CAP Memphis officers, Capt. E. J. Koller, Group 2 Commander, and First Lt. W. R. Hurley, training and operations, Group 2, at Wilson Field, Memphis. At bottom right, reading left to right are Corporals Florence M. Brooks, Dorothy Patton, Kay Fisher, Sgt. Elizabeth Spencer, Corp. Inez Littig and Pvt. Helen Stephens of Headquarters Flight in a CAP meteorology class at Southwestern College.

Memphis Unit Active in Cadet Recruiting

By S/SGT. THOMAS B. HILL
Tennessee Group 2

The Memphis squadron of Civil Air Patrol is actively engaged in recruiting cadets for the Army Air Corps Cadet Reserve and the Air WACs. An Army Liaison (L-2) airplane was recently assigned to Group 2 by the Army Air Forces to stimulate the recruitment program, and the plane, which will be rotated between CAP squadrons at Memphis, Jackson, Milan and Union City, will be based at CAP operating headquarters at Wilson Field.

The Memphis squadron also has an active CAP Cadet Squadron, composed of high school juniors and seniors affiliated with the senior CAP, who are receiving almost the same ground courses of training as Army aircrew trainees receive in College Training Detachments. When they become eighteen, they are trained and those desiring to enter the AAF find the transition much easier and have better chances of success, Capt. James I. Bell, president of the Memphis Aviation Cadet Examining Board, stated. The Memphis CAPC, which is under the supervision of CAP Lts. L. L. Brewer and Fred Bottom, has already completed courses in military courtesy and discipline, articles of war, safeguarding military information and military drill, and are now studying aircraft identification. At the present time, the CAPC class is full and a new class was expected to be organized shortly.

Control in Ole Miss

Future disasters in Mississippi will find the Civil Air Patrol fully alert and quickly available, as the result of the establishment of a "state emergency control center" under command of the governor. Major J. Robert Dowd, Wing Commander, represents the CAP on the control staff.

ATTENTION!

Effective with the December, 1943, issue, the CAP EDITION and the REGULAR EDITION of SOUTHERN FLIGHT were combined. The new 1944 Handbook will replace the former Inserts as a source of CAP information and will be included as a regular part of two-year CAP subscriptions. All CAP news is now carried in the regular edition.

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Postwar Continuance of CAP Activities Favored by Many

Since announcing its contest last month for letters answering the question "How and Why Should the Civil Air Patrol Be Made Permanent?", SOUTHERN FLIGHT has received numerous replies from widely separated areas urging postwar continuance of CAP activities.

"CAP is now and should continue to be the champion of private flying," commented one writer. Another — a young lady — emphasized how many ways CAP has served the interests of those desiring to become pilots but unable yet to undergo instruction and licensing. Some like the semi-military influence because it promotes strength in unity. Others think a purely civilian set-up would be effective when the war is over.

THE FIRST WINNER WILL BE ANNOUNCED IN NEXT MONTH'S ISSUE OF SOUTHERN FLIGHT, which will publish the winner's letter and award $64 in cash for it. Another $64 award will be made in April, and a third $64 award will be made in May.

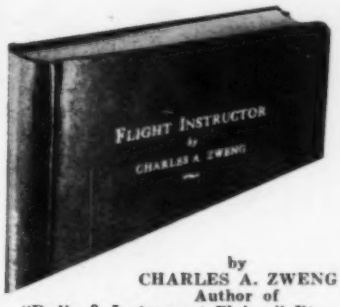
You can answer the $64 question. Just write us a letter, in 640 words or less, telling how and why you think the Civil Air Patrol should be continued after the war. That's all there is to it—nothing to buy, no coupons or box tops. Letters competing for the April award of $64 should be postmarked not later than March 15, and those competing for the May award of $64 should be postmarked not later than April 15.

SEND IN YOUR LETTERS TODAY!

The Editors
SOUTHERN FLIGHT
P. O. Box 750, Dallas 1, Texas

Missouri Wing Integrated With State Guard

The Missouri Civil Air Patrol Wing Command has been integrated with the Missouri State Guard, and Major David W. Kratz, CAP Wing Commander, has been named air officer on the state staff. Brig. General C. W. Gaylord retains his position as commanding general of the guard, while Major Kratz continues in his CAP position, in addition to his new appointment. The Missouri CAP will serve as the state guard's air arm, though both units will function as separate organizations. Larry W. Greene, formerly a Captain and commander of Kansas City Squadron 2, has been commissioned a Major and named executive officer of the Missouri Wing staff, and assistant air officer of the state guard. Both Major Kratz and Major Greene will hold dual commissions in the two organizations, and Major Greene will serve as acting Wing commander of the CAP. Wing headquarters have been moved into brigade headquarters at the St. Louis armory.



by
CHARLES A. ZWENG
Author of
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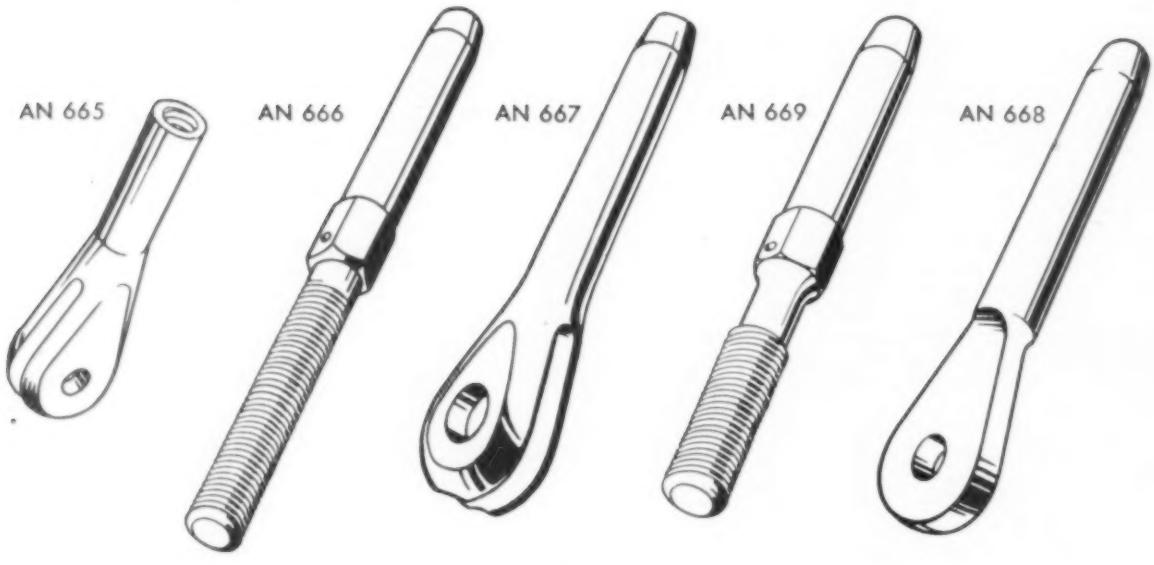

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